AMERICAN AGRICULTURIST

FOR THE

Farm, Garden, and Household.

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—Washington.

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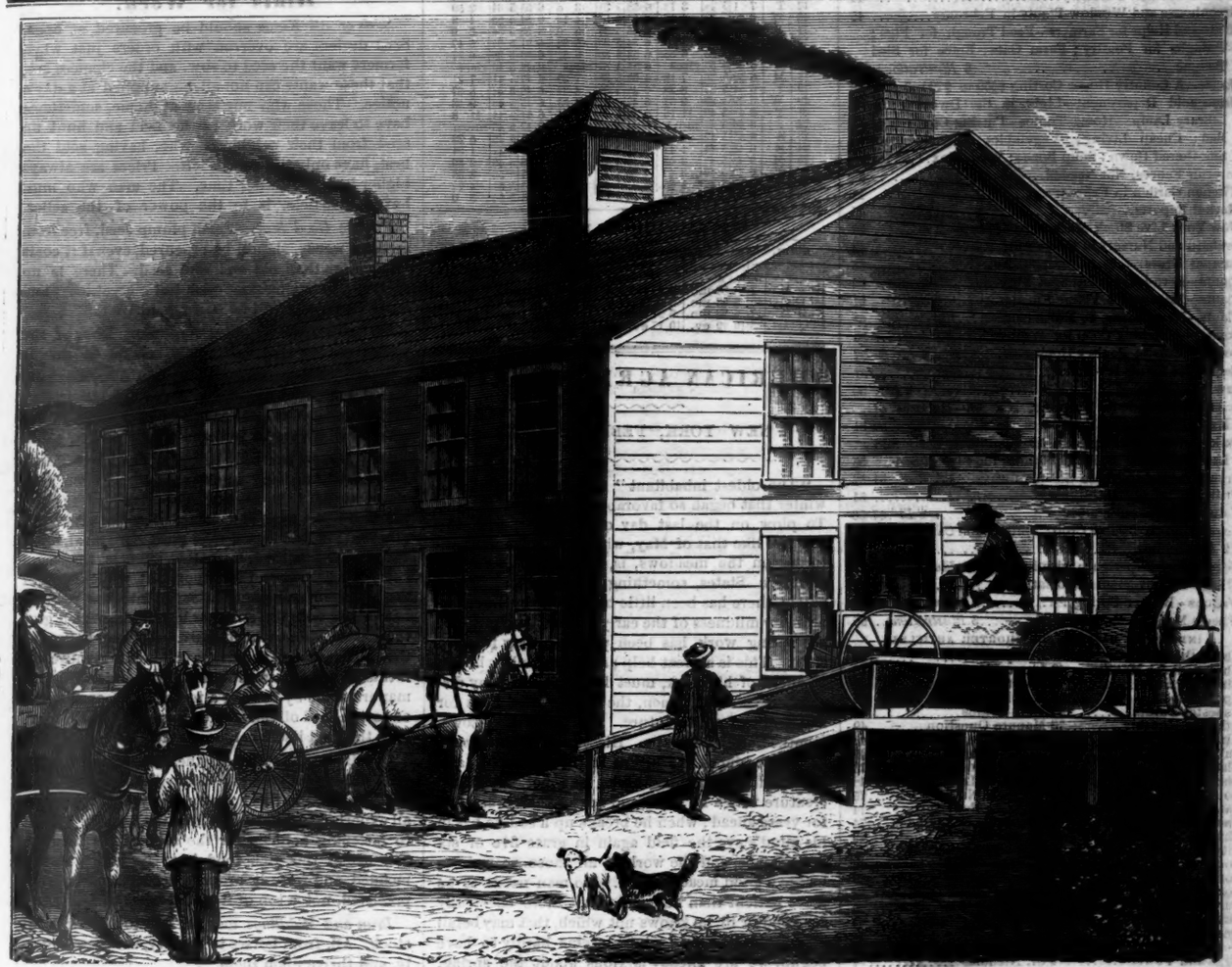

A VERMONT CHEESE FACTORY.—*Drawn and Engraved for the American Agriculturist.*

Upon subsequent pages, we have quite liberally illustrated the internal arrangement, and the appliances of a cheese factory, and to complete the series, we give above an engraving showing the exterior of a Vermont Factory, from a sketch by an artist of that State. The introduction of the factory system into a farming neighborhood, not only quite changes the mechanical operations of the dairy, but has a marked effect socially, upon the farmers themselves, and their families. Under the old system each worked by himself, in his own way, with but little reference to what his neighbors were doing, and rarely comparing his results with those of others. The factory changes all this, and by at once establishing a common interest, creates a community of thought and feeling; it becomes absolutely necessary that the neighbors should meet and discuss, to compare methods and ask advice; it leads to reading, and a general increase of intelligence and mental activity. In those States in which dairying is an important branch of farming, there are already Associations of Dairymen, who hold annual conventions, which are often attended by their wives and daughters. It is no disparagement to other similar gatherings, to say that we have never seen a gathering of farmers any where that seemed to be more thoroughly respectable, intelligent, or manifested more interest in the matters before them, than those we met at a meeting of the Vermont Dairymen's Association. The factory system divides the business of dairying into two important branches, viz: The production of milk, and the making of cheese, and each presents numerous subjects for consideration, which require accurate practical and scientific knowledge in discussing them. The annual conventions, held in various parts of the country, at which all the topics related to both branches of the business are thoroughly discussed, have already produced excellent results, manifested in increased profits, and a considerable improvement in the quality of the products. At these meetings the addresses and discussions are in part by farmers and factorymen themselves, and in part by teachers of scientific agriculture and chemistry. But besides these annual conventions, there are all over the country, and of daily occurrence, informal meetings, the discussions at which have an important influence upon the business of dairying. Such an informal dairyman's meeting is suggested in the engraving; the farmers who daily supply milk to the factory, meet there in small groups. On such occasions the talk is of the business in which all have an interest, and cows, feed, milk, and management are discussed, hints are given and experience told, and in the long run these informal meetings are quite as valuable as the larger ones; indeed, this intercourse, and mutual instruction, this bringing farmers into frequent contact, is one of the useful incidents growing out of the factory system, and which extends its good influence among the farmers to matters other than the dairying. Weights and a balance on the right side of the account book are convincing arguments, and the farmer who can point to a heavy balance in his favor, will find his associates ready to learn his method of managing his animals. While the cheese factory is profitable as an industrial institution, it is at the same time an educational one, that is practical and useful.

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All About California.—Those of our readers who desire reliable information in regard to the Pacific Coast, should get the "S. F. Weekly Bulletin," advertised in our columns. Its reputation is first-class in all respects. It is a good literary and family paper, as well as a faithful exponent of Pacific Coast facts. Mr. J. W. Simonton, the well known Agent of the Associated Press, is one of the principal owners of the "Bulletin."

Calendar for February.

Day of Month.	Day of Week.	Boston, N'Eng land, N. York State, Michigan, Wisconsin, Iowa, and Oregon. Sun rises.	Sun sets.	Mo'n rises.	N. Y. City, Ct., Philadelphia, New Jersey, Penn., Ohio, Indiana, and Illinois. Sun rises.	Sun sets.	Mo'n rises.	Washington, Maryland, Virginia, Kentucky, Missouri, and California. Sun rises.	Sun sets.	Mo'n rises.
		H. M	H. M	H. M.	H. M	H. M	H. M.	H. M	H. M	H. M.
1	F	7 14	5 14	7 9	7 10	5 18	7 3	7 6	5 22	6 58
2	S	7 13	5 15	sets	7 9	5 19	sets	7 5	5 23	sets.
3	S	7 12	5 17	6 40	7 8	5 20	6 40	7 5	5 24	6 43
4	M	7 10	5 18	7 38	7 7	5 21	7 40	7 4	5 25	7 44
5	T	7 9	5 19	8 39	7 6	5 23	8 41	7 3	5 26	8 42
6	W	7 8	5 21	9 40	7 5	5 24	9 39	7 2	5 27	9 38
7	T	7 7	5 22	10 43	7 4	5 25	10 40	7 0	5 28	10 38
8	F	7 6	5 23	11 47	7 3	5 26	11 43	6 59	5 30	11 40
9	S	7 5	5 25	morn	7 1	5 28	morn	6 58	5 31	morn
10	S	7 3	5 26	0 55	7 0	5 29	0 49	6 57	5 32	0 45
11	M	7 2	5 27	2 4	6 59	5 30	1 58	6 56	5 33	1 52
12	T	7 1	5 28	3 12	6 58	5 31	3 6	6 55	5 34	2 59
13	W	6 59	5 30	4 17	6 57	5 32	4 10	6 54	5 35	4 3
14	T	6 59	5 31	5 18	6 55	5 34	5 6	6 53	5 36	5 0
15	F	6 58	5 31	5 59	6 54	5 35	5 52	6 51	5 37	5 47
16	S	6 56	5 33	6 35	6 53	5 36	6 31	6 50	5 39	6 27
17	S	6 55	5 35	rises	6 51	5 37	rises	6 49	5 40	rises
18	M	6 53	5 36	7 18	6 50	5 38	7 20	6 47	5 41	7 21
19	T	6 51	5 37	8 38	6 48	5 39	8 37	6 46	5 42	8 37
20	W	6 49	5 39	9 57	6 47	5 41	9 55	6 45	5 43	9 53
21	T	6 48	5 40	11 16	6 46	5 42	11 11	6 44	5 44	11 8
22	F	6 46	5 41	morn	6 44	5 43	morn	6 42	5 45	morn
23	S	6 45	5 42	0 33	6 43	5 44	0 28	6 41	5 46	0 23
24	S	6 43	5 44	1 47	6 41	5 45	1 40	6 40	5 47	1 34
25	M	9 42	5 45	2 53	6 40	5 46	2 46	6 38	5 48	2 39
26	T	6 40	5 46	3 49	6 38	5 48	3 43	6 37	5 50	3 36
27	W	6 39	5 47	4 35	6 37	5 49	4 28	6 35	5 51	4 22
28	T	6 37	5 49	5 11	6 35	5 50	5 5	6 34	5 52	5 0

PHASES OF THE MOON.

MOON.	D.	BOSTON. H. M.	N. YORK. H. M.	WASH'N. H. M.	CHA'STON H. M.	CHICAGO. H. M.
New M'n	2	8 33 mo.	8 21 mo.	8 9 mo	7 57 mo.	7 27 mo.
1st Quart	10	8 33 mo.	8 21 mo.	8 9 mo	7 57 mo.	7 27 mo.
Full M'n	17	6 53 mo.	6 21 mo.	6 9 mo	5 57 mo.	5 27 mo.
3d Quart.	23	10 29 ev.	10 17 ev.	10 5 ev.	9 53 ev.	9 23 ev.

AMERICAN AGRICULTURIST.

NEW YORK, FEBRUARY, 1878.

"The oldest inhabitant" does not remember a winter that began so favorably as the present one. To plow on the last day of the year, with the weather like that of May, while the cows are pasturing on the meadows, is, for the Eastern and Northern States, something remarkable. Fortunately, there has been little harm done by the extraordinary mildness of the early winter; and much of the spring work has been put in a very forward state. This is a great help; a farmer, unless he can be ahead of his work, must labor under many disadvantages. Of all men, the farmer most lives for and works for the future. He plows and sows, months before he reaps. His young stock always appear to him as the future matured animals, and it is of these that he thinks, and not the young creature which he feeds and nurses. He must plan for years ahead; when he breaks up a sod he has in his mind's eye the field again in grass five or six years hence, and the work of all those years is to insure a good meadow then. No man needs to be more patient than he, nor to wait more cheerfully for good or ill, he knows not which, that may befall him. And now that winter seems hardly to have begun, we are already anxious about the spring, which will be at hand in a month, and planning what shall be done about this or that. The management of properly regulated farms should be planned, once for all. There should be no changes, except those regularly recurring which arrive year by year, and which follow one another as orderly as the changes of the seasons. The great fault of American farming is this constant desire for change. We change our farms as we would change the fashion of our coats. We rarely think of them as homes which our children shall occupy after us. It is the same with our stock, crops, and manner of farming. As the fashion comes up, or any new thing or idea is talked about, we cast aside, or leave the old, and take up the new. We do not take time to learn the value of what we have, or that there is good in every thing, if we only persevere and bring it out. We take up dairying, for instance, trying all the popular breeds of cows, and leave that to take up hops, tobacco, or fruits. Then we go to grain-growing, and finally begin to think the West, or the South, or orange-growing in Florida, is more desirable, and try to sell out; in the meantime we give no heart to our business, and that necessarily languishes. There are many exceptions, but this is the rule. We hear it talked over wherever farmers gather, and read of it in reports of farmers' clubs, and conventions. This is unprofitable. The farmer should be conservative, steady, patient, persevering, and contented, if he would be a successful and happy man. While the whole world depends upon him for food and clothing, he can never fail to have profitable employment, or find a market for his crops. The best farmers are those who discover what their farms are best fitted for, what they can do the best, and persevere in that—year by year becoming more proficient, more experienced, and more successful.

Hints for Work.

Seeds of All Kinds should be procured at once. Seed dealers are overrun with orders just when farmers want the seed to sow, and the chances are, that these wants can not all be supplied at a day's notice. Those who buy seed at home, sometimes have to leave their work in the field and hunt up seed from their neighbors, who, having sold the best, have only the refuse left. Prices are always higher just at sowing time. The man who *must* have an article, is in the power of the seller.

Procure Good Seed.—Fresh plump seed, free from seeds of weeds, should be procured, even if it costs much more than old and foul seed. There is no economy in buying poor seed, but a great loss; and care in selection will be well repaid.

Feeding Stock is the most important labor of the winter season, and intimately related to this is

Making Manure, which is, or should be, carefully considered in feeding stock, and where the quality of the manure-heap is carefully looked after, the stock will always be well and profitably fed.

Rich Manure can only be made from rich food. Animals add nothing to the manure. If we feed straw, we get back as manure something less than the straw we feed, and straw alone is very poor manure. If we feed oil cake meal, corn meal, bran, and similar rich food, to mature animals, they consume the starchy and fatty portions, while much of the nitrogen and phosphates go into the manure heap along with the straw or hay eaten, which give the needed bulk to the manure. The more nitrogen the food contains, the richer will be the manure. It is thus that the statement made by chemists, that the manure made by feeding a ton of bran, or linseed, or cotton seed oil cake, is for some soils worth more than the food itself, can be satisfactorily explained.

Oil Cake is the refuse of the manufacture of linseed and cotton seed oil. Many thousands of tons of it are made in this country yearly, but it is almost all exported to England, where the farmers feed it to fattening animals for the sake of the manure. The use of this rich food is to be highly recommended, and were it properly understood and appreciated, not a ton of it would leave this country.

Bran and Middlings may be fed to all kinds of stock. All, from horses to poultry, eat these eagerly, and thrive upon them.

Corn Stalks and Straw should be cut up with a fodder cutter if only to be thrown into the yard, or used for litter. Short stalks absorb more liquid than long; the manure from them is easier handled, and they rot more quickly. A fodder cutter run by a two-horse tread power, will cut 100 pounds of straw, or stalks, in five minutes, and the cost of the machine and often labor will be repaid in one season in the convenience of handling the short manure.

The Manure Heap may be made in a central place in the yard, and the different kinds of manure should be wheeled out of the stables and pens, and mixed together in the heap. We find it pays to turn over the heap once or twice during the winter, mix it thoroughly, and break up all the lumps. This makes it fine, and fit for use early in spring.

Manure is Wasted by exposure to washing rains, or by being trampled by stock in wet yards. It may easily lose three-fourths of its value in this way.

Manure that has been Drawn Out during the fine fall weather should be evenly spread, and not left in heaps, otherwise the places covered are too rich,

and the rest of the ground does not get its share. We see many fields now dotted over with heaps, hauled out in December. Leaving them until spring, is one of the small leaks which help to make greater ones.

Watering Stock is a very important part of the care needed for them at this season. Empty and clear the troughs of ice every afternoon, so that when filled in the morning there is no ice to chill the water. In cold weather water should not be drawn from the well until it is needed for the stock. Covers should be provided for all outside water troughs to keep out snow.

Clear away the Ice from watering places, gates, and all places where cows would be in danger of slipping; many a calf is lost by reason of cows falling upon icy places. If nothing else can be done, scatter upon the ice some coal-ashes, or sand, which will thaw in during sunshine and will freeze on to the surface at night, and make it rough.

A Smoke House may be prepared and set up ready for use next month, when bacon and hams may be taken from the pickle. A store of corn cobs may now be saved for the smoking. A smoke house, 6 feet square, and 8 feet high, made of double boards, will be sufficient to cure a large quantity of meat by beginning early. Finish this work, and have the meat packed away safely before the flies appear.

Stone Boats.—A very seasonable work now is to procure some heavy plank, and make a stone boat for every team. One does not know how useful these implements are on a farm, until they are tried. To haul stone is only one of their many uses.

Harness will be greatly improved by taking it apart, washing with soap and water, and dressing it with some good water-proof preservative. We have used the "Tunyoap Water-tight," made by the Tunyoap Manufacturing Co., of Boston, for harness as well as for the soles and upper leathers of boots. It renders the leather soft and impenetrable by water.

Draining in wet swamps can be done all through the winter months with ease and comfort. We provide a plank about 12 feet long, either at the side of the ditch or in the bottom of it, to stand upon while working. This keeps the feet dry. But little frost penetrates swampy ground, even in the coldest weather, and if the surface that is partly dug is left loose at night, it can be broken up with ease. Contracts for ditching 2 feet deep, and 2 feet wide at the top, have been made for 25 cents a rod.

Grinding Feed is profitable. Ground feed goes farther in use than whole grain. Where the money can be afforded to purchase a mill, this can be done with profit where 10 head of stock are kept. A mill that will grind 4,000 bushels before it needs repair, can be bought for $50, or less. There is a saving of 400 bushels in the shape of toll, and the time of going to mill besides. This latter will be about equal to the time taken up in grinding at home, and there will be left the value of the 400 bushels of grain for the $50 spent, and the mill can be made as good as new at a small cost.

Young Stock.—To keep young stock growing through the winter, will hasten their maturity by half the time. A good thrifty 2-year-old that has had no set-back, will be equal in weight to a 4-year-old that has not grown during the winters. The cost of two years feed is saved by the expenditure of the little extra feed and care for two winters. This principle applies to all live stock.

Over-Feeding is a waste of food, and causes a loss of flesh. Indigestion from repletion, stops growth, and gives trouble to restore health and thrift. The art of feeding is an important part of a farmer's knowledge, and should be studied with care, and practised with patience and close observation. The use of weights and measures is not a waste of time and labor. There is much to be learned and saved by them. Every feed-box should have a one-quart and a two-quart scoop, and a feed measure holding a known quantity. A half-peck measure (4 quarts) is a handy size to have.

Feed Troughs and Racks should be provided for yard feeding, both for grain and fodder, so that nothing may be trampled under foot, and wasted, and strong animals may not drive off or annoy the weaker ones. We can easily contrive so that the animals of all kinds must do precisely as we wish.

Separate Yards for feeding may be made by putting up a few panels of portable, or other fence, across the main yards. A few strands of fence wire, stretched from one side to the other, make a good division, and the snow does not drift against it.

Smutty Corn.—The wet weather of the past summer has caused much smut to grow in the corn. This fungus is poisonous to animals, and doubtless is the cause of much unexplained trouble. The smutty stalks should have been laid on one side in the field; but if not done, throw out now and burn. The dust of the smut is its seed, and, if permitted to escape, will perpetuate the pest.

Cows.—Preserve strict cleanliness in the cows' stables. Dry cows may be fed moderately to keep them in fair condition only. Heavy milkers, when near the time of coming in, need judicious treatment, so as not to unduly stimulate the secretion of milk. Milking cows should be kept warm. If the udders, or teats, become foul, they should be washed with warm—but not hot—water, and wiped perfectly dry at once. To wash the teats, and leave them to dry, will cause cracks; the same effect will occur if the teats are wetted with milk and left to dry. The teats should be kept dry while milking, if one would avoid cracks and sores.

Ewes and Lambs.—Light feeding of grain is preferable for ewes at this season. Too much corn meal will be positively injurious. Half a pint of corn a day will be sufficient, alternated with a pint of wheat, bran, or whole rye. A mixture of one quart of salt, and one ounce of sulphur, placed in a box where the sheep can always reach it, will be beneficial. Early lambs with their dams should have warm pens in sheltered parts of the stables during the coldest weather. Such pens are very useful for ewes that reject their lambs.

Young Lambs are troubled with few complaints; the chief of these is costiveness, which may easily be remedied by giving a teaspoonful of castor oil. New-born lambs should have a little of the oil applied to their hind parts to prevent the glutinous dung from closing the bowel. This should be looked for and guarded against, or remedied without delay.

Young Pigs that arrive this month need the best of care, or they will be lost. They are hardy animals after the first dangers are over, and they are able to help themselves. A stove in the piggery would be found very useful; or if a separate building, well warmed with a stove, could be provided for occasional use in the cold weather, many young animals might be saved that are now lost.

Poultry.—We find that it pays well to warm the feed for hens. It is a very easy matter to put a pan of corn in the oven over night, and have it warm for the morning feed. For the afternoon feed we put in the oven about noon a pan of cracked corn covered with water. When this has swollen, and soaked up the water, it makes excellent feed. Some of the Imperial Egg Food may be given twice a week at this season.

A Clean Poultry House is indispensable, if the fowls are expected to be healthy. It is a small job to scrape, sweep, and dust the floor, and remove the droppings twice or three times a week during feeding time. The droppings should not be stored in the poultry-house, but in a dry place, packed in barrels, and kept for use in the spring.

Sundry Matters.—It will be well to turn out potatoes that have been kept in barrels, or bins, to prevent sprouting. Potatoes have a tendency to sprout this season, and should be closely looked to.... Air the cellar thoroughly on a cool dry day to lower the temperature; 35 degrees is warm enough for a vegetable cellar....Clean machines, washing the gummy parts with kerosene oil, and wiping them off with a bundle of rags dipped in sperm oil.... Watch root pits closely, and see that the ventilation is ample and perfect. Roots are growing very much in the pits this winter in consequence of the mild weather. To prevent this, we have opened the pits at the bottom by thrusting in a sharp-pointed bar every two feet, and letting in cold air to reduce the temperature....Ice should be gathered as early as possible. Late ice is not so solid as that gathered during the short days when the sun has little power to soften and make it porous....To preserve health, keep the feet warm and dry, the throat and chest well protected, and when warm with exercise avoid standing still, or cooling off suddenly. The last named precaution relates as much to working animals as to their owners.

Notes on Orchard and Garden Work.

If one near the end of a letter begins to talk about the weather, it is regarded as indicating that the writer is running short of ideas. To avoid any such suspicion, we put the weather at the beginning. What a winter this has been, thus far! We write on January 15th, and there have not been, we should judge, 15 days (12 miles N. and W. from New York City) in which late fall or early spring work could not go on in the open ground. The gardener or farmer who had not his fall work thoroughly done up this New Year's day, is not likely to ever have it so. Gossip about the weather is of but little use unless we can draw some lesson from it. Cultivators in this vicinity have paid dearly for one lesson—which is, that routine work will not always answer. Those who have followed their usual custom of covering up their pits of roots and their trenches of celery for the winter, on a given date, have learned that this is a not a safe practice. The losses from decay are said to be very general, where the full covering has been placed on stored vegetables, while those who postponed the covering until it should be found to be needed, escaped damage.... In protecting living plants, we notice that the practice has been much modified of late years. It is quite easy to kill a half hardy plant with too much covering; indeed it is not unlikely that many plants have the reputation of being "very tender," instead of "half hardy," because in the trials that have been made of them they have been covered too much. A clump of *Osmanthus, Skimmia*, and other plants heretofore regarded as unsafe in the open ground in our climate, we have now in their third winter out. Pea brush is stuck around them, and enough salt-hay thrown in among it to shade the plants, but not sufficient to prevent circulation of air. They came through the last winter, which was a very severe one, unharmed. It is likely that with similar treatment, other plants which we feel obliged to house might be left out of doors. Strawberry plants are often killed by too thick a covering, under which they do not get fairly dormant. What the effect of this unusual weather will be upon peaches, and other easily excitable trees and plants, remains to be seen.

Orchard and Nursery.

Were we to devote the whole paper to it, we could not say all that might be said in any one department; hence we point out each month the important matters on which a novice is most likely to need a reminder. This month one may find occupation in caring for the old trees he already has, or in preparing to plant new orchards, and it may happen that he must attend to both.

Renovating Old Trees.—There is a popular notion that trees get into an unproductive condition through a neglect of pruning, and that a thorough pruning is all that is needed to restore them to a healthful and fruitful state. This is a mistake. While pruning is usually needed, this is not the chief want of the trees. They have been brought to their poverty by starvation, and their great need is food. This being supplied, pruning, scraping, and other treatment may come in to aid.

Manure being the first thing needed, the fertility of the orchard may be brought up by a generous application of barn-yard manure, spread upon the surface, and turned under by a shallow plowing. In the absence of sufficient manure, then green crops, buckwheat, or clover, may be sown, to be turned under, with application of lime, or ashes. Having provided for the soil, then

Pruning may be considered, if the variety is known to be a desirable one. In pruning an old,

or any other tree, it should be done with a definite object. If branches have been broken, or are partly decayed; if the head is so crowded that light and air can not enter; if limbs cross and chafe one another; if the head is quite one-sided, or if for any other reason a removal of a portion of the top will be beneficial, then use the saw.

Time and Means of pruning.—The preferable time is when severe weather is over, and before vegetation has started, which in the Northern States is generally the latter part of this, and the first part of next month. Use a pruning saw or other narrow-bladed saw, with the teeth set wide; smooth the wounds with a drawing knife, and then cover them with melted grafting wax, or thick paint.

Scraping and Washing the old bark is useful; sufficient is said about this on page 51 ...If the tree produces indifferent fruit then, besides the renovation already mentioned, it should be

Grafted with some good sort, but it will be of little use to graft an old tree if it is still to be starved. With a large tree, it is better to graft only about one-third of the head each year, beginning with the branches in the center of the tree. The time is just as the buds begin to swell. The mechanical operation was very plainly described, and fully illustrated, in April, last year. It is not practicable to repeat these elementary matters every year, and for this reason we advise every one who has an orchard and fruit garden to provide himself with a work upon tree culture. The back numbers may be procured for 15c. each....In planting new orchards, no time should be lost in making the

Selection of Varieties, if not already done, and in ordering the trees. In deciding what to plant, the disposition to be made of the fruit is to be regarded. If the fruit is to be for family use only, then the varieties should comprise those that will give a supply from the earliest to the latest. If fruit is for market, and to be shipped a long distance, then but a few sorts known as the best for keeping and shipping will be better than many sorts ripening at different times. Those whose orchards are near cities, find large and showy early fruit more profitable than late kinds. In selecting varieties, those not familiar with them will do well to consult the fruit growers of their vicinity; this advice will be of far more value than that of persons at a distance.

"*Where Shall I Buy?*"—is a question often asked of us, and to which we reply in general terms:—Buy only of nurserymen of established reputation—the cards of such are found in our advertising columns. A little extra freight, or a few cents in the price of a tree, is nothing when compared with the risk in purchasing of unknown parties. One must wait from 6 to 10 years for his trees to bear, and the chance of finding them all wrong at the end of this time, is one not to be taken....In a newly settled country one may profitably buy

Root Grafts, which are sold at some nurseries at very low rates. These consist of a part of the root of a stock, with the cion inserted and waxed in. The work is done in winter, and the grafted roots kept in earth in a cool cellar until spring. A thousand of these grafts will pack in a box of moderate size. They should be set out in spring as soon as the soil can be well prepared, in rows 3½ feet apart, with the root-grafts 18 to 24 inches apart; the grafts, which should have only half an inch or so of the top above the surface, are usually set with a dibble, and care should be taken to have the soil well packed around the root. The ground must be kept clean, and the young trees kept to a leading stem the first year, in which they will grow from one to two feet high. In subsequent years, the cultivation should continue, the trees shaped as needed, and with three, or at most four years growth, they will be large enough to plant out. There need be but few failures, and in localities far from nurseries may be made a source of profit.

Mice and Rabbits are likely to be troublesome in localities where snows still fall. Prevent damage as suggested last month.

Insects must be looked after now. The clusters of eggs of the *Tent Caterpillar* may easily be seen against the sky in a dull day; they are to be looked for as a ring about ¾ of an inch wide, near the ends of the twigs. Cutting and burning one of these destroys about 500 caterpillars.... *The Canker Worm* has unfortunately reached places where it was not known a few years ago. The insects come out of the ground in early spring—sometimes in February in a warm time—ascend the trees to lay their eggs, from which will come a devastating brood that will take every leaf. They are easily kept down, as the female is wingless, and has to *climb* up the trunk. A barrier applied early, and kept in good condition, will stop them. There are numerous contrivances; the simplest is a band of stiff paper applied closely to the trunk, to which is applied pine tar or printer's ink. These must be examined every few days, and the application renewed if not sticky, as sometimes dust and the bodies of dead insects make a bridge for the living insects to cross upon.

Fruit Garden.

The plants in the fruit-garden coming into bearing much sooner, and being watched more closely, the need of abundant manuring is more manifest here than with the slower growing and longer-lived trees of the orchard. What is said of the necessity of perfecting plans in advance, and preparing for planting under Orchard, applies here. The fruit-garden is for what are known as Small Fruits; if trees are admitted they should only be

Dwarf Fruit Trees.—We were surprised to learn from a usually intelligent merchant a few days ago, that he supposed dwarf pears were distinct kinds, and different from those upon large or standard trees. As others may have the same impression, it may be well to say that the dwarf pears, apples, etc., are made so by grafting or budding the ordinary varieties on a stock that controls and stunts their growth; this causes them to come into bearing very young, and to be very fruitful in proportion to their size. The pear is grafted on a quince stock, to dwarf it, the apple, for the same purpose, on a kind of apple called the Paradise. There are also dwarfing stocks for cherries, plums, etc., and there are two or three peaches that are natural dwarfs.

Shall We Plant Dwarf Trees? has long been discussed by fruit-growers. With the exception of a few pears, the conclusion is that for profit they are of but little value, but if one wishes to grow many varieties on a small space, or for ornament, they possess much interest for the amateur.

Pruning may be done on dwarf trees, and if grapes, currants, gooseberries, etc., were not finished last fall, they should be pruned on mild days.

Supports are needed by blackberries, for which we use a stake standing about 6 feet out of the ground; some give them a wire trellis, such as we use for raspberries, but higher. This kind of a support is made by setting a strong stake, or small post, at each end of the row; a heavy galvanized wire is attached to a post by one end, and the other is fastened to a piece of ½-inch iron rod, upon which a screw thread is cut; this rod passes through the other post, a nut put on, by the turning of which the wire is tightened; a washer is put between the nut and the post. The vines are tied to the wire.

For Grape Trellises in a small vineyard, we prefer the upright wires. Posts are set 8 feet apart, a strip 2½ inches wide nailed on a foot from the ground; a corresponding strip nailed above this at the top of the posts; the distance (and hight of the posts also) being governed by the length one chooses to grow the canes; some have it but 3 feet, others 4 feet, or more. The arms of the vine are fastened to the lower strip, and a perpendicular wire, fastened by a twist to the lower and upper strip, is placed for each shoot. When one wishes to train his vines in this manner, this is an excellent trellis. But a grape vine is so tractable that it will accommodate itself to almost any situation, and supports should be made to suit them. Supports of all kinds should be made ready in advance, and if to be painted, this may be done before hand.

Kitchen and Market Garden.

The difficulties in keeping stored roots, where unusually mild weather has prevailed, have been alluded to; this weather must also unfavorably affect

Plants in Cold-Frames, which have thus far required the sashes but a few days this season, and it has been almost impossible to maintain the dormant state so necessary to their proper wintering. Beyond thorough exposure, and shading where practicable, during sunny days, the gardener can do nothing to counteract the weather.

Hot-Beds, for starting early plants, will be required in the warmer States. The rule is to make the bed six weeks before it is usually safe to set plants in the open ground; consequently the earlier the season opens in any locality, the sooner should this preparation be begun. In these Notes for February of last year, the matter was treated in full detail. Our space now will allow of only a brief summary.

Cold-Frames and Hot-Beds are the same in all respects, save that the latter is warmed by a layer of fermenting manure. In an article on Cauliflowers, page 63, Mr. Henderson sufficiently describes a cold-frame. It is used for keeping cabbages, lettuce, and other nearly hardy plants, through the winter, and to forward plants in the manner referred to in the article. Besides these, the frame may be used for sowing seeds, and though the results will not be so early as in a hot-bed, some weeks may be gained. By exposure to the sun during the day, and covering the sashes before the heat declines in the afternoon, the interior can be kept quite warm. For a hot-bed

Sashes, Frame, and Manure are needed. The usual size of sash, 3 x 6 feet, with five rows of 6 x 8 glass, set in rabbeted bars, which run lengthwise—there being no cross bars, but the glass is lapped about ¼ inch, without putty at the lap. These sashes are sold at the factories glazed or unglazed. The frame is built in a pit, 2½ feet deep, 6 feet wide, and of a length to hold the number of sashes. The pit is lined with rough boards, nailed to posts, and which extend above the surface of the ground a foot at the rear and 4 to 6 inches at front. Slats should be provided from front to rear where each pair of sashes meet, to guide the sashes and to hold them when pushed part way down.

The Manure may be all stable manure, or mixed with one-half more or less of leaves. It should be in a heating state, and put into the pit with coarse and fine equally distributed, beating the layers down with the fork, and when full, tramp the manure down level. Spread on 6 inches of rich soil (put under cover last fall), and place the sashes.

Sowing the Seeds.—The heat of the bed will at first be too violent, and the seeds must not be sown until it declines; when the thermometer shows about 80° it will be safe to sow the seeds, which should be in rows 4 inches apart, and running from front to rear....We prefer

Sowing Seeds in Boxes, or flats, which are wooden trays about 2 inches deep, with bottom and sides securely nailed. They are made from soap-boxes and similar packages, one of which will make two or three. Where these are used, only 2 or 3 inches of soil are placed on the manure, and the boxes, in which the seeds are sown, are set upon this.

Care of the Bed must be thorough, as the neglect of a few hours will ruin all. The temperature should be kept as near 75° as possible; this is maintained by tilting or pushing down the sash when too warm, covering on cool nights; shading on hot days. Besides this care, which will be needed each morning and evening, and oftener in sudden changes, the plants must be watered, the soil stirred between the rows, and be thinned if too thick.

Window Boxes answer nearly all the purposes of a hot-bed for a family garden, in which the number of plants required is small. The boxes, or flats, already referred to, or other convenient box, will answer. A kitchen window is preferable to any other, as the air is usually more moist. Sow seeds in such window boxes, and when the plants are up, turn the boxes every day, to bring the opposite side to the light, and keep them from growing to one side. When the seedlings get two or three "rough" leaves, those beyond the seed-leaves, they should be "pricked out" or planted in other similar boxes, setting them an inch or more apart, according to kind. The young plants may grow in these

until time to put them in the open ground. Set the box out doors in the middle of every mild day, or open the windows, in order to harden the plants.

The Kinds Usually Sown in hot-beds, frames, and window boxes, are cabbages, cauliflowers, and others of that family; lettuce, tomatoes, peppers, and egg-plants; the last two will do a month later. Cucumbers, melons, and early squashes, may be started later, a few seeds to give plants enough for a hill, in a small box or 4-inch pot. The roots of these are large, and do not succeed in a small pot.

What to Sow.—We have in former years given a list of varieties that our experience has shown to be quite satisfactory; this year Mr. Henderson gives on page 62 his experience, which is much the same as ours. We always advise sowing the main crop of well-tested varieties, and while we advocate the testing of all the new things that one can afford to try, we regard it as highly unsafe to depend upon untried novelties for the family supply.

Where to Buy.—Look through our advertising pages, and send for catalogues. We do not commend one dealer in preference to another. We believe that all whose advertisements are admitted, will do as they agree. The low rates of postage on seeds, makes it unnecessary to regard locality; the distant purchasers can easily reach dealers, wherever they may be, and *vice versa*.

Seeds on Hand should be carefully looked over; while some are just as good as ever at the end of several years, others have a limited vitality. Onions, leeks, and parsnips should always be of the former season's growth. Beans, peas, egg-plant, carrot, okra, pepper, salsify, sage, and other sweet herbs, keep safely for two years. Radish, spinach, and parsley, are good at three years old. Cabbage, and all of its tribe, including turnips of all kinds, and celery, keep perfectly well for four years. Others seem to be quite as good at the end of five or ten years, as at first, such as melon, squash, and all that family, with beets and tomatoes. When in doubt about any seed, test it before time for sowing. Count out a dozen or twenty seeds, and sow them in a little earth in a cup, placed in a warm place, and the earth kept moist. If half or two-thirds sprout, it will be safe to sow the seeds.

Implements, Fertilizers, and whatever else is to be purchased, should be on hand before the hurry of the spring work begins....Get bean-poles and pea-brush before vegetation starts....Have extra parts to all implements liable to be broken.

Flower Garden and Lawn.

So much space has been given to other departments, that we may only say as to this that all preparatory work, such as planning new lawns, paths, and borders and selection of trees and shrubs for planting, should be done while there is yet leisure. ....Ornamental trees of all kinds, but especially evergreens, should be guarded against injury from heavy snow falls, by shaking the snow from the tops, and digging it away from the lower branches.

Greenhouse and Window Plants.

The increasing sun will bring many plants into flower, and at the same time encourage the insects, for the treatment of which quite full Notes were given in December last. Free use of tobacco smoke or tobacco water, where it is inconvenient to use smoke, will destroy many. A small collection of plants, tended by one really fond of them, may be kept free of insects by mere "thumb and finger work." Daily examination, the use of a stiffish brush, like an old tooth-brush, and a pointed stick to pick off mealy bugs and scale, will keep insects from doing harm. Neglect to examine in time, and nip the trouble in the bud, is the cause of much of the difficulty. More water will be needed by plants in bloom and making their growth....Bulbs, if any remain in the cellar, may be brought to the heat and light. When the flowers fade on the earlier ones, cut away the stalk and let the leaves grow on; when they begin to fade, dry off the bulbs, which may be planted in the garden afterwards.

Commercial Matters—Market Prices.

The following condensed, comprehensive tables, carefully prepared specially for the *American Agriculturist*, from our daily record during the year, show at a glance the transactions for the month ending Jan. 12th, 1878, and for the corresponding month last year, and also for the year ending Dec. 31, 1877:

1. TRANSACTIONS AT THE NEW YORK MARKETS.

RECEIPTS.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
25 d's *this* m'th	397,000	3,981,000	2,463,000	181,000	416,000	546,000
25 d's *last* m'th	473,000	4,116,000	3,491,000	383,000	1,312,000	1,407,000
SALES.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
25 d's *this* m'th	343,000	4,104,000	3,513,000	159,000	341,000	839,000
25 d's *last* m'th	491,000	5,129,000	4,151,000	481,000	1,227,000	1,286,000

2. *Comparison with same period at this time last year.*

RECEIPTS.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
25 days 1878	397,000	3,281,000	2,463,000	181,000	416,000	564,000
25 days 1877	207,000	791,000	904,000	92,000	227,000	517,000
SALES.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
24 days 1878	343,000	4,104,000	3,513,000	159,000	341,000	839,000
25 days 1877	291,000	2,238,000	1,469,000	50,500	289,000	601,000

3. *Stock of grain in store at New York.*

	Wheat. bush.	*Corn.* bush.	*Rye.* bush.	*Barley.* bush.	*Oats.* bush.	*Malt.* bush.
Jan. 10, 1878	2,586,715	105,960	286,333	913,988	1,667,985	321,474
Dec. 10, 1877	2,844,962	1,724,229	399,077	864,787	1,879,052	338,849
Nov. 5, 1877	984,374	2,643,502	166,949	368,429	1,770,759	329,388
Oct. 8, 1877	288,698	2,975,838	28,526	69,046	881,326	370,166
May 7, 1877	761,686	468,809	195,046	174,375	847,881	291,654
Feb. 7, 1877	3,083,819	2,302,361	374,142	671,114	966,114	388,605
Jan. 8, 1877	3,663,010	3,077,504	341,750	905,615	1,083,104	423,406
Dec. 11, 1876	3,110,283	3,385,554	218,841	873,310	1,182,322	512,041
Aug. 7, 1876	2,831,209	904,537	94,960	58,914	1,232,265	434,248
Apr. 10, 1876	3,893,074	232,140	68,429	200,381	706,282	496,942
Jan. 10, 1876	5,802,293	663,962	100,741	325,191	1,080,300	907,458

4. *Receipts of Breadstuffs in New York in each of the last nine years:*

	Flour. bbls.	*Wheat.* bush.	*Corn.* bush.	*Rye.* bush.	*Barley.* bush.	*Oats.* bush.
1877	3,639,394	24,751,154	34,827,575	1,975,392	8,843,319	11,703,339
1876	4,000,562	26,866,221	26,657,669	1,611,912	6,746,196	12,140,676
1875	3,940,273	34,214,736	22,485,707	301,654	4,767,946	10,636,077
1874	4,017,207	41,817,215	29,329,000	592,114	2,776,025	10,792,919
1873	3,546,068	33,559,870	24,559,315	992,447	2,418,526	11,235,420
1872	3,030,771	16,229,418	25,292,156	491,563	5,117,351	12,486,318
1831	3,649,045	26,518,360	27,108,156	1,055,621	3,869,123	12,546,966
1870	4,143,993	24,083,742	9,143,478	550,169	5,020,718	9,626,606
1869	3,533,716	23,813,632	11,666,781	357,803	3,007,938	8,747,822

5. *Exports from New York, Jan. 1 to Dec. 31.*

	Flour. bbls.	*Wheat.* bush.	*Corn.* bush.	*Rye.* bush.	*Barley.* bush.	*Oats.* bush.
1877	1,587,106	21,385,774	25,373,942	2 049,706	2,412,500	237,634
1876	1,894,158	24,227,852	15,994,817	1,837,164	88,132	619,554
1875	1,954,189	26,192,698	12,933,740	206,893	7,505	138,752
1874	2,177,008	31,791,249	19,000,935	641,661	3,560	122,528
1873	1,963,231	27,891,829	15,387,527	1,009,138	19,378	49,710
1872	1,179,050	13,144,956	27,864,000	668,547	22,656	31,480
1871	1,659,755	21,968,643	13,046,850	525,772	98,745	47,810
1870	1,950,234	18,446,085	487,792	92,434	——	28,986
1869	1,582,211	18,210,586	1,637,566	142,542	——	49,398

6. *Exports from New York, Jan. 1 to Jan. 10.*

	Flour. bbls.	*Wheat.* bush.	*Corn.* bush.	*Rye.* bush.	*Barley.* bush.	*Oats.* bush.	*Peas.* bush.
1878	47,060	704,757	320,123	27,587	54,250	1,298	3,798
1877	39,420	466,708	42,293	7,934	——	4,285	18,143
1876	71,713	521,558	433,851	2,810	——	6,183	32,093
1875	67,408	732,422	48,573	——	——	4,719	5,095

Gold has been up to 103¼, and down to 102⅝, closing Jan. 12, at 102⅝, as against 103 on Dec. 12; 102⅝ on Nov. 12; 103 on Oct. 12; 105⅞ on July 12; 104⅞ on June 12; 107¼ on May 12; 104⅝ on March 12; 106 on January 12, 1877....The Breadstuff interests have sufferred from various adverse influences during the month, and have shown serious depression, on a restricted volume of business, as well for home use as for export, closing heavily. Reports and rumors—especially toward the close—as to the probabilities of a restoration of peace in Europe, have been decidedly against the outward movement, which has also been unfavorably affected by the stronger range of ocean freights. Flour sales fell off to a very limited aggregate. Spring Wheat and new crop Corn closed moderately active at the reduced quotations. Winter Wheat generally dull, and quoted irregular. Within the month comparatively liberal export purchases have been made of choice White Wheat, and best No. 1 Spring, the latter in especial favor with buyers. Oats have been less freely dealt in, and left off weak. Rye and Barley have attracted less attention. The export call for Barley has been within narrow limits....A further material decline has occurred in Hogs and Hog Products, bringing prices down to the lowest prices in many years, influenced by the very free offerings here and at prominent points in the interior, particularly Chicago. At the reduced quotations, dealings have been on an extensive scale—in Lard and Bacon remarkably so for export. Beef and Beef Hams have been quoted about steady, but not active. Choice to fancy grades of Butter have been in good request at stronger rates; poorer qualities slow of sale and unsettled as to price. Cheese has been in fair demand at about former figures. Eggs have fallen off materially in price, closing weak; recent arrivals in excess of current requirements, and supplies accumulating....An active business has been reported in Hops, largely for export, within the quoted range ...Cotton has been less freely dealt in at variable prices....Wool in fair demand, and held with confidence... Tobacco moderately sought after at about previous rates.....Seeds generally quiet; rough flax wanted; values quoted, as a rule, steady. The exports of Clover Seed from this port, from Sept. 1 to Dec. 31, 1877, were 23,184 bags; and of Timothy Seed, 29,095 bags. ....Hay and straw have been in moderate demand, and prices have been fairly supported....A fairly active movement has been reported in Ocean and general cargo freights, though checked, in part, by the stronger rates claimed by shipowners....Grain rates by steam to Liverpool closed on the 12th of Jan. at 9⅝*d.* @ 9¾*d.*; to Glasgow at 9¾*d.*; to London at 9½*d.*; to Bristol at 9¾*d.*; to Hull at 9½*d.*; to the Continent at 9¾@10*d.*; to Liverpool, by sail, 8@8½*d.*; London, by sail, 8½*d.*, per bush. Flour to Liverpool, by steam, 2*s.* 9*d.*; London, by sail, 2*s.* 9*d.*, and by steam 3*s.* 6*d.*@3*s.* 9*d.*; Bristol, by steam, 3*s.* 6*d.* per bbl. Provisions by steam to Liverpool, 40*s.* @ 45*s.* per ton; Cotton by sail 13/64@½*d.*, and steam at ½@ 9/32*d.* ℔ lb. Grain, by sail, for Cork and orders, at 6*s.* 3*d.*@6*s.* 4½*d.*, and to Continental ports, 6*s.* 3*d.* @ 6*s.* 6*d.*; Italian ports, 5*s.* 7½*d*@5*s.* 10½*d.* per quarter; to Lisbon, in ship's bags, 16 cts. per bushel; to Oporto, in shippers' bags, 7*s.* 3*d.* per quarter.

CURRENT WHOLESALE PRICES.

	Dec. 12.	Jan. 12.
	103	**102 1-2**
PRICE OF GOLD		
FLOUR—Super to Extra State ℔ bbl	$4 85 @ 6 00	$4 35 @ 5 75
Super to Extra Southern	4 90 @ 6 75	4 50 @ 6 50
Extra Western	5 45 @ 9 75	5 00 @ 9 75
Extra Genesee	6 00 @ 7 50	5 35 @ 7 25
Superfine Western	4 85 @ 5 35	4 35 @ 5 10
RYE FLOUR	3 65 @ 4 30	3 25 @ 4 25
CORN-MEAL	2 60 @ 3 25	2 60 @ 3 25
BUCKWHEAT FLOUR, ℔ 100 lbs	2 30 @ 2 75	2 00 @ 2 65
BUCKWHEAT, per bush	68 @ 69	64 @ 65
WHEAT—All Kinds of White	1 42 @ 1 59	1 40 @ 1 52
All Kinds of Red and Amber	1 15 @ 1 50	1 00 @ 1 48
CORN—Yellow	58 @ 66	56 @ 63
Mixed	57¾@ 65	53 @ 63
White	58 @ 66	57 @ 64
OATS—Western	38½@ 43½	37 @ 43
State	39 @ 44	38 @ 43
RYE	72 @ 78	71 @ 77
BARLEY	70 @ 1 08	65 @ 1 05
BARLEY MALT	70 @ 1 25	70 @ 1 20
HAY—Bale, ℔ 100 lbs	40 @ 95	40 @ 95
STRAW, ℔ 100 lbs	35 @ 65	40 @ 65
COTTON—Middlings, ℔ lb	11¼@ 11¾	11⅜@ 11¾
HOPS—Crop of 1877, ℔ lb	5 @ 18	5 @ 18
" old, ℔ lb	3 @ 6	2 @ 6
FEATHERS—Live Geese, ℔ lb	45 @ 50	45 @ 50
SEED—Clover, West., & St'n ℔ lb	8¼@ 8¾	8 @ 9
Timothy, ℔ bushel	1 35 @ 1 40	1 35 @ 1 40
Flax, ℔ bushel	1 50 @ 1 52½	1 55 @ 1 60
SUGAR—Refi'g & Grocery ℔ lb	6¼@ 9	6¼@ 8⅝
MOLASSES, Cuba, ℔ gal. 50 test	38 @ 40	Nominal.
New Orleans, ℔ gal	32 @ 48	30 @ 48
COFFEE—Rio (Gold)	16 @ 20	15½@ 18¾
TOBACCO, Kentucky, &c., ℔ lb	4 @ 15	4 @ 15
Seed Leaf, ℔ lb	4 @ 50	4 @ 50
WOOL—Domestic Fleece, ℔ lb	26 @ 35	28 @ 32
Domestic, pulled, ℔ lb	28 @ 38	20 @ 40
California, spring clip	12 @ 31	13 @ 32
California fall clip	10 @ 25	10 @ 28
TALLOW, ℔ lb	7¼@ 7⅝	7⅛@ 7¼
OIL CAKE, ℔ ton	34 00 @ —	—@32 00
PORK—Mess, ℔ barrel	13 12½@13 50	12 00 @12 50
Extra Prime, ℔ barrel	9 00 @ 9 50	8 00 @10 00
BEEF—Extra mess	13 00 @13 50	12 50 @13 00
LARD, in tres. & bbls, ℔ 100 lb	8 12½@ 8 90	7 62½@ 8 25
BUTTER—State, ℔ lb	12 @ 35	12 @ 35
Western, poor to fancy, ℔ lb	9 @ 25	9 @ 28
CHEESE	5 @ 13	5 @ 13¼
EGGS—Fresh, ℔ dozen	20 @ 26	15 @ 22
POULTRY—Fowls & Chickens	8 @ 14	7 @ 15
Turkeys—℔ lb	7 @ 16	10 @ 14
Geese, ℔ pair	1 12½@ 2 00	1 25 @ 2 00
Ducks, ℔ pair	50 @ 75	60 @ 90
Roosters, ℔ lb	6 @ 7	5 @ 7
DUCKS, Wild, ℔ pair	25 @ 2 50	33 @ 2 50
GROUSE, ℔ pair	50 @ 1 00	70 @ 1 25
PARTRIDGE, ℔ pair	40 @ 75	50 @ 1 00
QUAIL, ℔ dozen	75 @ 1 50	1 50 @ 2 50
PLOVER, ℔ doz	1 25 @ 1 37	Nominal.
SNIPE, per doz	30 @ 1 37	Nominal.
VENISON, ℔ lb	7 @ 12	Nominal.
RABBITS, ℔ pair	40 @ 50	40 @ 50
HARES, ℔ pair	25 @ 30	30 @ 50
TURNIPS ℔ bbl	60 @ 75	65 @ 75
CABBAGES—℔ 100	2 00 @ 3 00	2 75 @ 4 50
" Red	— @ —	2 50 @ 4 00
ONIONS—new, ℔ bbl	1 50 @ 2 00	1 25 @ 1 75
LETTUCE, ℔ bbl	50 @1 00	Nominal.
CARROTS, ℔ bbl	50 @ 75	75 @ 1 00
POTATOES—℔ bbl	1 25 @ 2 12½	1 25 @ 2 00
SWEET POTATOES—℔ bbl	1 50 @ 2 50	1 50 @ 2 50
BEETS, ℔ bbl	50 @ 75	50 @ 75
PEAS—Canada, in bond, ℔ bu	85 @ 86	82 @ 83
green, ℔ bush	1 40 @ 1 45	1 30 @ 1 35
BEANS—℔ bushel	1 70 @ 2 65	1 60 @ 2 75
BROOM-CORN	4 @ 7¼	4 @ 7¼
APPLES—℔ barrel	1 75 @ 5 00	1 50 @ 3 75
CELERY, per dozen	75 @ 1 00	60 @ 75
CAULIFLOWER, ℔ bbl	1 00 @ 3 50	1 25 @ 3 00
OKRA, ℔ 100	15 @ 30	15 @ 30
PEANUTS, domestic, ℔ bush	1 15 @ 1 50	1 45 @ 1 60
GRAPES, ℔ lb	3 @ 7	3 @ 7½
CRANBERRIES—℔ bbl	5 00 @ 6 50	5 50 @ 6 50
" ℔ crate	— @ —	75 @2 00
ORANGES, Florida, ℔ bbl	5 00 @ 8 00	5 00 @ 9 00

New York Live-Stock Markets.

RECEIPTS.

WEEK ENDING	*Beeves.*	*Cows.*	*Calves.*	*Sheep.*	*Swine.*
Dec. 17	8,034	93	1,135	26,850	47,674
Dec 24	8,838	71	1,261	17,120	29,086
Dec. 31	6,334	80	982	11,947	31,958
Jan. 7	8,419	63	973	24,288	37,527
Jan. 14	10,427	77	818	25,803	48,436
Total for 5 Weeks	42,052	384	4,769	106,008	194,676
do. *for prev. 4 Weeks*	35,904	314	4,631	95,222	147,854

	Beeves.	*Cows.*	*Calves.*	*Sheep.*	*Swine.*
Average per Week	8,410	77	954	21,201	38,935
do. do. *last Month*	9,226	78	1,157	23,805	36,963
do. do. *prev's Month*	9,470	87	2,157	29,049	32,263

Beeves.—The dullness of the market was never greater than at the close of 1877. The depression in general business, and the decreased consumption of beef is shown by the condition of the market. Formerly a matter of 200 to 250 cars of beeves a day made no impression on prices, but sales briskly cleared the yards. The first week of 1878 offered a wonderful contrast, 18 cars one day, and 28 the next, barely met the demand, and when a few more cars arrived the next day after, down went prices. Fine, dry weather, and small receipts put up prices ¼c. per lb., but the heavy receipts of the last week knocked the strength out of the market, and the advance was lost. The market closed very weak; some

good Colorado steers of 1,500 lbs., selling at 9½c. to dress 56 lbs. to the cwt.; good natives for 10@10½c. ℔ lb, 57 lb to the cwt., and extra at 11@11½c. for 58 lbs. to the cwt.

The prices for the past five weeks were as follows:

WEEK ENDING	*Range.*	*Large Sales.*	*Aver.*
Dec. 17.....	8¼@13 c.	9 @11 c.	9¼@10 c.
Dec. 24.....	7 @12 c.	8¾@11 c.	9¼@ 9¾c.
Dec. 31.....	8 @12 c.	9 @10¼c.	9¼@ 9½c.
Jan. 7.....	7¼@12 c.	9¼@10¼c.	9 @10 c.
Jan. 14.....	7¼@11¾c.	9 @10¼c.	9¼@ 9¾c.

Cows.—Good cows are in demand, and sell quickly at $60@$90 for extra good milkers; fair cows bring $50, and poor from $30 to $40 per head. Poor cows have sold with difficulty....**Calves.**—The crowding on the market of unsalable stock has reduced prices very low. At one time the past month 2¼c. ℔ lb only was paid for grassers. Hog-dressed veals have been in good demand, and sell for 8@9c. ℔ lb; poor veals sold for 5@6¼c. ℔ lb live weight, and grass calves could hardly be moved at 2¼c. ℔ lb live weight at the close of our report....**Sheep and Lambs.**—The market for this stock may be called dead; killed by overstocking. A great many sheep are carried over unsold. The only bright day during the month was when only 800 arrived and sold quickly at ½c. ℔ lb advance on former rates. Heavy arrivals put the market back again. A notable example of extremes was offered by the exhibition of some poor Texans of 63 lbs. average, which sold for 2½c. ℔ lb., and some Canada Sheep of 160 lbs. average, some weighing 300 lbs., which sold for 6½c. ℔ lb. The market closed very weak at 4¼ @ 6c. ℔ lb. for fair to good sheep, and 7c. ℔ lb. for lambs, live weight....**Swine.**—Dulness rules the trade. Some days no sales are reported, and prices are nominal. As we close this is the case for live hogs, quoted only at 4¼ @ 4½c. ℔ lb. City dressed sold very low to move them; 4¾ @ 5½c. ℔ lb., was all that could be procured. Western dressed are held but not sold at 5c. Jersey dressed slow at 5 @ 6½c. ℔ lb.

Prices of Feed.

Bran, per ton	$18.00@$20.00
Middlings, per ton	19.00@ 21.00
Ground Feed, per ton	15.00@ 21.00
Linseed-oil-cake, western, per ton	44.00@ 47.00
Cotton-seed-cake, per ton	25.50@ 40.00
Chandler's Scraps, per lb	3@ 4

Prices of Fertilizers.

No. 1. Peruv. Guano 10 p. ct. ammonia, standard, ℔ ton	$56.50
do. do. Lobos, do. do. do	47.50
do. do. guaranteed, ℔ ton, cargo F	56.00
do. do. rectified, per ton, 9.70 p. c.	69.00
do. do. do. do. 8.40 p. c.	51.00
Soluble Pacific Guano, ℔ ton	45.00
Excelsior Fertilizer Works, Fine Ground Raw Bone,	55.00
Mapes' Complete Manure (Ville formula) p. 1,000 lbs	26.14
do. Spring Wheat Manure, ℔ 1,000 lbs.,	25.00
do. Fruit and Vine Manure, do.	17.50
do. Bone, strictly pure, meal .....per ton.	42.00
do. do. do. extra fine.... do.	40.00
do. do. do. fine..... do.	38.00
do. do. do. medium..... do.	36.00
do. Lawn Top Dressing..... do.	60.00
do. Potato Manure, (Ville Formula)... do.	51.94
Stockbridge Corn Manure, (Boston) per acre...	22.00
" Potato do do do	12.00
" Tobacco do do do	60.00
" Rye do do do	11.00
" Wheat do do do	16.00
Bowker's Hill and Drill Fertilizer, per ton.....	45.00
Sulphate of Magnesia (35 to 60 per cent), per ton.	22.50
Gypsum, Nova Scotia, ground, per ton.....	8.00
Nitrate of Potash (95 per cent.), per lb.	9½c.
Sulphate of Potash (actual potash 44 per cent) per lb....	4 c.
do. do. (actual potash 27½ per cent) per lb	2 c.
German Potash Salts (actual potash 12 to 15 p. c. p. ton	$18.00
Muriate of Potash (actual potash 50 per cent), per lb...	2½c.
Nitrate of Soda, per lb.....	4¼c.@ 4½c.
Sulphate of Ammonia (25 per cent.), per lb....	4½c.@ 5 c.
Dried Blood or Dried Meat (ammonia 14 per cent) p. ton	$50

Export of Farm Products in 1877.

The condensed, but very comprehensive tables on page 45, are prepared expressly for the *American Agriculturist* by a gentleman who daily, throughout the year, attends the N. Y. Corn Exchange to gather information, prices, etc. These tables will be found very interesting. The 5th table will be disappointing in the amount of exports of Breadstuffs. The exports of wheat and flour were less in 1877 than in 1876, notwithstanding the large yield of 1877, owing to the high rates maintained by speculators, and the holding back the crop for increased prices by the producers themselves. Should the war in Europe soon close, prices will probably fall. There is, however, a notable increase in the export of corn (nearly 10,000,000 bushels), also in Rye and Barley. There has been also a considerable increase in the shipment of Wheat and Flour since January 1, as compared with last year.

From May 1st, 1877, to January 11th, 1878, the export of BUTTER from New York amounted to 16,471,407 lbs., against 10,193,309 lbs. for the same period the previous year.—CHEESE, 109,274,566 lbs., against 75,348,082 lbs. the previous period.

FRESH BEEF exports during 1877, from New York, Philadelphia, Boston, and Portland, Me., 101,971,504 lbs., valued at $10,047,699.—LIVE CATTLE exported from same places in 1877, 20,057 head, valued at $2,987,540. Total value of cattle and beef, $13,035,239. Pounds of MUTTON, 2,114,340; value $119,500. Live Sheep 13,176 head; value $63,960. Total Export from four Ports, of live and dressed (fresh) Beef and Mutton in 1877, **$13,218,699.** An increase of more than 600 per cent over any previous year.

The American Agriculturist for February 1st contains, as usual, 60 or more engravings, illustrating a variety of labor-saving and other contrivances, five of them showing Cheese Factory operations; one of a Country House costing $550 to $700, with specifications; others of Plants, Household Conveniences, and for the Children.—The Hints about work, best kind of garden vegetables, etc., are quite full.—An important chapter on Farm Experiments—Among the Farmers, No. 25—Talk on Farm Crops, No. 12—Village Improvement Associations—Home Topics—Exposure of Sundry Humbugs—with a great variety of longer and shorter articles on a multitude of topics, giving practical, useful information, making altogether a most complete, beautiful, instructive Journal worthy of a place in every household—certainly cheap at $1.60 a year. Single copies 15 cents; specimens 10 cents each. ORANGE JUDD COMPANY, Publishers, New York.

containing a great variety of Items, including many good Hints and Suggestions which we throw into smaller type and condensed form, for want of room elsewhere.

Publishers' Notices, Terms, etc.—The Annual Subscription Rates of the *American Agriculturist*, postage prepaid by the Publishers, are: One Copy, $1.60 a year; *Two* Copies, $3; *Three* Copies, $4.20 ($1.40 each); *Four* Copies, $5.20 ($1.30 each); *Five* to *Nine* Copies, $1.25 each; *Ten* to *Nineteen* Copies, $1.20 each; *Twenty* Copies and upwards, $1.10 each; Single Numbers, 15 cents, post-paid.—The above terms are for the United States and Territories, and British America. To the above add 14 cents extra per year for papers delivered by mail in N. Y. City, and for copies sent outside of the United States and British America, *except* to Africa, Brazil, British Honduras, the East Indies, and Mexico. For the last named five countries the extra charge is 38 cents per year, to cover extra postage; Single Numbers, 17 cents, post-paid.....**Remittances,** payable to Order of Orange Judd Company, may be sent in form of Checks or Drafts on N. Y. City Banks or Bankers; or P. O. Money Orders; or in Registered Letters, such letters to have the money enclosed in the presence of the Postmaster, and his receipt taken for it, and the postage and registering to be put on in stamps. Money remitted in any one of the above three methods is safe against loss..**Bound Volumes** from Vol. 16 to 36 inclusive, supplied at $2 each, or $2.30 if to be sent by mail. Sets of numbers sent to the office will be bound in our regular style for 75 cents (30 cents extra if to be returned by mail). Missing numbers for such volumes supplied at 12 cents each.—**Any Numbers** of the paper issued for 21 years past, sent post paid for 15 cents each; or *any* full year, sent unbound, for $1.60.....**Clubs** of Subscribers can be increased at any time, at the club rates, if new members begin at same date as original club.

The German American Agriculturist is receiving large subscriptions from every quarter, indicating that the additions and improvements made in it are being recognized and appreciated. It is the only purely German Agricultural paper in the United States, and we intend, with the assistance of our English readers, to at least double its circulation during the present year. Please make known to your German neighbors the merits of the English *Agriculturist*, and that they can for the same price have the German edition, which contains all the engravings and valuable articles of the English edition, with the addition of a valuable Special Department, edited by the Hon. Fred. Münch.

Trouble With Field Mice.—A note from Coles Co., Ill., states that the district is over-run with field mice, to the great loss of the crops. How many boys are there in Coles Co. of the age of 12—indeed how many men "big enough, old enough, and ought to know better," who will not go out of their way to kill everything in the shape of a snake—for no other reason than it is a *snake*, and consequently no business to live? The harmless reptile is, in reality, fulfilling the object of its existence quite as well—to say the least, as the boy or man who kills it. How many boys (or males big enough to be men), who own, or can borrow a gun, will not shoot at, or indeed, spend half a day in hunting every little owl, or Sparrow-hawk, or Mouse-hawk? the last of these lives almost solely on field mice, which also form the principal food of most of the smaller birds of prey. If we will persist in killing, or in allowing to be killed, the insect-eating birds, we must expect insects to increase. If we will destroy or drive away the birds and snakes provided to keep field mice in check, we must kill the mice ourselves, or suffer the loss of our crops.

Provide for Seed, Implements, Plants, etc., NOW.—It is bad planning to wait until just as anything is wanted, before securing it. This comparatively leisure month is the time to calculate what is going to be needed in April and May, to study up the advertisements and see what is offered: to correspond with dealers, get their catalogues and prices; to make up orders and dispatch them, and fix the time you want them surely on hand—putting the time far enough in advance to have no delay occur by freshets, bad weather, or accident, and get a positive promise that the order will be filled. The dealers will be better prepared with good articles, and taking time by the forelock, will be a great gain. See "Hints for Work," p. 43.

A Flea "as large as an Ox."—Our ideas of the *size* of a thing are wholly by comparison. The moon, when seen out in the clear sky, appears no larger than an 8 or 10 inch ring or disk. When just rising from the horizon, where it is seen *in comparison* with objects on the earth, it often looks to be twenty to fifty feet or more in diameter. The other day a gentleman called to say that our Microscope surely did not magnify 25 diameters, or 625 surfaces. Having two glass slides, each containing a dried specimen of a flea, we put one of them under the springs in his Microscope, and asked him to hold it up to the light, and say *how large it looked*.—"About as large as a pig," he answered. We then held the other slide up near the Microscope, and asked him to look at this with the unaided eye, and at the one in the Microscope, alternately, a few times, and then asked how large the magnified one now looked.—"*As large as an Ox*," he promptly answered, and departed abundantly satisfied as to our statement of its magnifying power.—So well satisfied was he that he subscribed for five copies of the paper and five Microscopes to be sent to his friends. Any one can test this question by using two small transparent objects *of about the same size*, one in, and the other outside of, the Microscope.

Need of Veterinary Education.—The value of live stock in the United States amounts to over one thousand millions of dollars, the aggregate number of farm animals being as follows:

Horses & Mules	11,149,800	Sheep	35,935,300
Cattle	27,870,700	Swine	25,726,800

No other country in the world approaches these figures. But no other country, rich in live stock, is so ill provided with veterinary assistance as we are. Practically all this vast number of animals is without medical care, for the few practiced surgeons are entirely insufficient to the care of one-thousandth part of them. Millions of dollars are sacrificed yearly for want of competent medical assistance for cattle when ill. Veterinary schools are needed, and hundreds of competent practitioners.

Live Stock in Iowa.—The State Auditor, of Iowa, publishes a statement, showing the number and assessed value of the live stock in that State for the last ten years. This very interesting document gives a clear view of the steady increase of the wealth of Iowa in cattle, as well as the surprising decay of sheep growing. We give the figures for 1867 and 1877 as follows:

1867.	*Value.*	1877.	*Value.*
Cattle.. 686,109..	$8,628,941	Cattle..1,452,546.	$14,898,841
Horses..343,593..	16,532,925	Horses.. 639,385..	20,100,263
Mules... 17,267..	1,125,410	Mules... 42,887..	1,670,154
Swine. .776,412..	1,483,945	Swine..1,654,708..	3,899,301
Sheep..1,354,608..	2,084,476	Sheep.. 318,439..	345,827

Good Corn and Flour Cake.—At the house of a friend this morning, we had some corn-bread, so-called, which was very palatable, and, as usual, we asked the "particulars" for our readers. It proved to be half flour, viz., one quart each of corn-meal and wheat flour; two beaten eggs; one tea-cup molasses; one tea-spoonful of soda mashed fine. Mix all together with sweet milk, soft, and bake in a quick oven. The "quick oven" generally has much to do with producing good cake or bread, if not too quick to spoil the crust.

About the Microscope.

Sundry Notes.

I.—Disappointment.—An occasional note of disappointment comes from some one who has not got into the way of using his Microscope, so as to understand and appreciate its real value. To such we will say that it is all and *more* than we have promised for it, or about it, and we hope they will persevere in learning *how* to use it until it becomes, what it ought to be, and can be, to all, a most valuable, most interesting, and most useful instrument. We know it may be made to every person, worth ten-fold the entire cost of both the Microscope and this Journal for a year, and in this we are confirmed by the united testimony of many scientific men and others, who have had long experience with microscopes of various grades.—To help the uninitiated, we first sent out a six-page description of its use. After the first few thousand, we added another slip with more minute simple directions (partly printed in Jan. No., page 9). Now we send with each Microscope a combination of both sheets and other additions, in a 14-column sheet. Let any one still failing to make good use of the Microscope, send for this 14-column sheet, if he has not received either this or the first two. See page 66.

II.—Delay in Sending Them.—Despite the constant pressing of the work at the manufactory, and the employment of all the careful help we can make room for, in dispatching the instruments, the care and labor required to send them accurately, with the multitudes of directions to pick out of subscriber's letters ordering them (often quite obscure and uncertain in specific directions), we have been from two to six days behind in filling several of the orders. Though we shall now keep pretty close up to daily orders, we ask our readers to always allow us a leeway of say 8 or 10 days from the reception of their letters to dispatch the instruments. Usually it will be but three or four days. The names and subscriptions must first be entered in the alphabetical mail books, next the paper mailed, and then the forwarders have to consult the express and other routes, pack them, enter them in two books, one for the express office, and take the receipts for them, etc., and this too, with calls for 800 to 1,500 a day.

III.—Who Can Have Them.—*Every* subscriber to the *American Agriculturist* for 1878 can have one of the Microscopes delivered free to him, in any part of the United States or Canadas, on payment of 55 cents, or 40 cents if it be taken at the office, 245 Broadway. This is a good deal below the actual cost to us, but that we calculated upon at the start, though the expense and work is considerably more than we at first expected.

IV.—Through News Agencies.—Those who take their paper through News Dealers, can have the Microscope just the same as subscribers on our own books, if their news dealers will assure us that they have paid him for the paper through the year. We can not afford to supply it to those who take only an occasional number, or part of the Volume. In setting the price below the cost, it was based on a whole year's subscription.

V.—The Price to Non-Subscribers is invariably $1.65, if delivered, or $1.50 if taken at the office. Several who have larger microscopes, and have received one each as subscribers, have bought others at $1.50 to be used by their children, by classes of pupils, etc., and call them very cheap. Such sales help out on the general expense.

VI.—A Loose Microscope—Remedy.—"Paterfamilias" writes: "....My large family of sons and daughters constitute a 'Microscope Club' of themselves, and keep the instrument in almost constant use. Continual wear has loosened the lens tube a little upon the upright shaft. How shall I tighten it?"—Press the tube in a little at any place, by inserting the point of a pen-knife between it and the rubber. Or, more simply, slip into the tube a very small fibre of silk, or cotton, obtained by untwisting and picking to pieces a bit of thread. The finest whole thread will be too large. Draw the *fiber* through the tube, and, insert the upright.

VII.—A General Educator of the People.—A distinguished scientific gentleman, in a private note, says: "....Your Microscope is the finest thing in the way of a newspaper premium enterprise that I have ever seen. It will prove a *general educator of the people*, inciting them to observe and study the wonderful world of small natural objects everywhere around us, and lead them on to further investigation. It will thus not only awaken interest in an important way, but multitudes of cultivators will find it eminently useful in detecting causes of disease in plants and animals."

Cross of Shorthorns and West Highland Cattle.—Mr. J. A. Cochrane, the well known breeder of Hillhurst Canada, has recently experimented with a cross of West Highland heifers with Shorthorn bulls. The produce has been tested, and has been found very satisfactory. A steer 29 months and 10 days old was recently slaughtered; the live weight empty of food was 1,222 pounds, the dressed weight was 797 lbs. of beef; 73¼ lbs. of hide, and 67 lbs. of tallow; total, 937½ pounds, or 73 lbs. to the 100 of live weight. While the weight is not equal to that of good specimens of the pure Shorthorn at that age, yet the small loss in dressing this half-bred proves it to be a very profitable cross. The steer was weaned at four months old, and since then was fed upon hay and turnips in the winter, and grass in the summer, until he was put up for stall feeding two months before he was slaughtered.

Progress of Settlement in Minnesota.—The St. Paul Chamber of Commerce issue a card containing statistics, prepared by the State Commissioner, by which is shown that the wheat crop for 1877 reached forty million bushels; the total assessment for 1850 was $806,473, and in 1877 was $218,855,743; there are 3,600 common schools, a school fund of 3½ millions of dollars, and the population, which was 5,330 in 1850, is now 675,000.

The Hessian Fly.—"J. A.," Henderson, Ky. The pest of the wheat plant is now operating destructively in many parts of the country. We hear of it in Michigan, Wisconsin, Canada, New York, Ohio, Pennsylvania, Tennessee, Kentucky, and localities between. It is a small two-winged fly, which lays eggs upon the leaf of the wheat in August or September. These eggs hatch into small white grubs, which descend to the base of the stalk, and there suck the juices, causing the wheat to turn yellow, or to die. Soon after the grubs change to pupæ, very similar in color and shape to a flax seed, and these remain until spring, when they change to the mature fly. The fly then deposits eggs in May, but the larvæ is too late to do much injury to the wheat. The "flax-seed" condition is entered in June, and in July the second brood of flies appear. The remedies are burning the stubbles immediately after harvest, or plowing them under deeply so as to destroy the pupæ which may be in hiding; to sow late in the Northern States, so that the flies may have laid their eggs before the wheat appears above ground; rolling the young wheat, by which the eggs are crushed; sowing salt, soot, or fine lime upon the young wheat, by which the maggots are killed, and generally by good cultivation and fertilizing to stimulate the wheat so as to enable it to resist the damage.

The Travis Wheat Hoe.—"C. K. C.," Oakland Co., Mich., sends the following statement of his experience:—I used a Travis wheat hoe on part of a field of winter wheat, early in May last. The field had already been harrowed, and clover seed sown on it. We hoed a strip through the field, leaving each side as it was. I have watched this strip closely during the summer. The ground on it was more soft and yielding, and the wheat had a ranker appearance. At harvesting we could see a plain difference. As we cut with the reaper directly across the strip, we could see that the straw was brighter and stronger, and the heads plumper than on either side. Our estimate was that it would yield twenty-five per cent more than the rest of the field. I believe it very important to give our wheat ground a thorough loosening in the spring, and if we ever equal the English farmers in producing wheat, we will have to resort to hoeing. The large yields of wheat of the last season demonstrates the fact that our soils will produce as large crops as theirs, if we give them a fair chance. I am satisfied that the hidebound condition of our wheat fields in the spring of the year, requires a thorough loosening, and the common harrow does not do it deep enough. Timothy seed had been sown with the wheat in the fall, and the hoeing did not seem to injure it.

Pipe for the Conveyance of Water.—"A. C.," Carrol Co., Md. To convey water 1,000 feet with a fall of five feet only, the pipe should be 1½-inch in diameter the first 500 feet, and one inch for the remainder. If smaller, the outlet flow will be very small.

Malt Combs, or Sprouts.—"L. D.," Lonsdale, R. I. The sample sent is malt combs, or the sprouts from malted barley and oats. This is from a mixed lot evidently, there being oats, barley, cockle, and seeds of foxtail grass mixed with the sprouts. The malt has probably been made from a very inferior quality of grain having oats, cockle, and foxtail mixed with it. Malt combs, when clean, are a very nutritious food for milk cows, and are cheaper at one cent a pound than bran at one cent and a quarter.

A House for 200 Fowls.—"W. R. M.," Morris Co., N. J. To accommodate 150 to 200 fowls, it would be best to have two houses, or rather one so divided in the middle as to make two with a door at each end. A very cheap and good house may be made of boards; 4 feet high at the back, 10 feet in front, 16 feet wide, and 36 feet long. The roosts should be made at the rear, and in the form of a ladder, sloping back from the floor to the roof. In the middle there may be a room for nest boxes. If the front, which should face the south, is of glass, it will be much improved. As large a yard as possible may be provided, and fenced with lath, so that the fowls may be kept in when desirable. The materials for such a house need not cost more than $30, and $12 additional for sash for the front.

Sundry Humbugs.

The Editors, who do not, of necessity, know much about the business affairs of the paper, can judge fairly of the character of the subscriptions by the editorial correspondence. One of the straws which show that we are receiving many new subscribers, is the Humbug correspondence. If soon after the beginning of the year, we receive a large number of letters relating to humbugs that have been exposed long ago, we are quite sure that a great many persons make the acquaintance of the *American Agriculturist* for the first time, and gratified to learn of a quarter where their complaints will be listened to, we at once find our humbug budget rapidly increasing. It does not matter that the great majority of these complaints have been already noticed, they are new to those who send them, and we are glad to see them, as one of the indications that we are receiving new subscribers and making new friends. The old circulars of

"A DECISION AT LAST,"

that variously worded story of a supplementary drawing, in which people get gold watches and lots of jewelry—*by paying for them.* We have heretofore mentioned "Russell & Co.," and "Hetherington & Co.," as being mixed up in a way we could not understand. In all the cases, so far as we recollect, the "Decision at Last" circulars say that the "Gold Watches" and "Jewelry" are to be had by paying the assessment to "Russell & Co.," but many applicants would get letters from "Hetherington & Co.," referring to the same business. Lately, there appears the firm of "Clark & Co.," who write to a correspondent: "We have been appointed by the Finance Committee, instead of Messrs. Russell & Co., to Ship the Goods, collect the Percentage money, and forward it to New Orleans." Can it be that, like Othello's, "Russell & Co.'s"

"OCCUPATION'S GONE?"

Those who have had no tickets in the "Consolidated Lotteries"—and the great majority of those who receive circulars have none—need not care whether "Clark & Co.," or "Hetherington & Co.," are other names for "Russell & Co.," or who is who, in the matter. Some persons—in the chance of getting for $15 (or any other sum) "Gold Watches," and lots of "Jewelry," "valued at $150," (or any other sum)—are *willing to admit* the statement of the circular, that "the interest you held in one of the Lotteries represented by the Committee on Unclaimed Prizes, has resulted in your drawing" so and so. Now, every one knows whether he *had* or did *not have* an "interest" in one of these lotteries. If he had no ticket or "interest" in any lottery whatever, every honest man knows that the circular *does not mean sum*, and there's the end of it. If one is tempted to accept a statement (that he had an interest in some defunct lottery) which *he knows is not true*, and sends $15 (or any other sum) to get Watches or Jewelry valued at $150 (or other sum), and gets these—and afterwards finds that the articles are not worth the money he paid, he must go somewhere else for sympathy. He may be disappointed, but as he was willing to take advantage of a statement he *knew* was not true—the verdict of every honest man will be—"Served him right."

"THE ROYAL DOMINION GIFT CONCERT"

is new as to time, but old as to wicked ways. Can there be any graduates from the "Wyoming" and "Topeka" swindles running the thing? Though it exists under an "effete monarchy" it has all the airs and graces of a Gr-r-r-eat and Glor-r-rious Republic. Just as those "Wyoming" and "Topeka" chaps did, so does this "R-r-r-oyal" thing. It sends a private (lithographed) letter, to people in the States, informing them, if they will send $5, for a club of five tickets, their names are booked for a prize *sure pop.* They may find some Americans fool enough to play the part of "stool

pigeons" in their swindle, but we are glad to know of some cases in which "the putty did not stick." We have devoted more space than usual

TO LOTTERY SCHEMES,

as they are the most fascinating of all forms of humbug. Many think that they are fairly conducted games of chance, and if they invest, they only "take their chances" with the others—while the fact is they have no chance at all. These lotteries are *rotten* through and through, and the prizes pretended to be drawn, are generally "put up jobs," and given out merely as *bait* to catch others. Let them alone in all their manifestations, of "Gift Concerts," "Distributions," "Legal Decisions," and every other form, shape and style.

THE "BUTTER-COMPOUND" CHAP,

whose powder will enable one to turn out no end of butter at "Four Cents a Pound" seems to have exhausted the "Great West" and to be working eastward. The butter stuff "takes its way" in just an opposite direction to Bishop Berkley's "Course of Empire." The butter-compound man at one time hailed from a town in Ohio. Then Western New York was his dwelling place. At last he located in Hartford where we were sure we had him. One Hartford friend called on him and found the door shut, but with a hole for letters. He called again and again, but no butter-compound man could he find. Now the chap turns up in Middlesex Co., Mass., and within about 20 miles of "The Hub."—If we do not mistake the Massachusetts dairy people who pride themselves on the excellence of their butter, this "four cents a pound" fellow will have a hard time of it.

THE EXERCISE OF COMMON SENSE

in the matter will show its utter absurdity. The circulars of this butter-compound man, actually shout and shriek for people to come and buy his stuff, which will allow them to make butter at "four cents a pound," and the "best of butter," "which cannot be detected from pure cream butter." Just look at it from a business point of view; "the best of butter" retails in Boston any where from 50c. to $1.25 per lb. But suppose we put the "best of butter" at the low price of poor butter, 20c. per lb., 100 lbs. would sell for $20. It is claimed that it can be made for 4c. a pound, or $4, leaving a profit of at least $16 on every hundred pounds. If this could be clearly shown at the Merchants' Exchange on State Street, this butter powder man could raise a million of dollars in one day, to go into the manufacture of this butter. He could get independently rich in a year. Yet, instead of doing this, he sends out his circulars, fairly beseeching *other people* to get rich by buying his stuff at $1 per box (to make 100 lbs. of butter) at retail, or $6 per doz. Now, look here, farmers, isn't this just altogether, quite absolutely too thin? We do not understand the "glamour" which all such propositions seem to fix upon the eyes of ordinarily shrewd people. Hundreds fall under it, else these humbugs could not flourish. With regard to this "Butter Humbug," right in your own precinct, we call upon you gentlemen of the "Massachusetts State Board of Agriculture," and you gentlemen of the "Massachusetts Society for the Promotion of Agriculture," who are doing so much good in other directions, to take up this vile fraud upon your farmers. Skin it of all its specious fallacies, and show up its naked carcass as a thing to be avoided.

MEDICAL MATTERS

are duller than we have known them in a long time; even the old things seem to have lost their vitality, and the "7 Barks" chap offers premiums of cake baskets and things to those who make the quickest sales. Some of these medical chaps send out circulars with the taking titles of "The Art of Money Making," "How to Get Rich," and the like, but we soon come to the same old story—sell their stuff, and make money.....We may as well say here to one very earnest person, who, to judge from his long letters on many foolscap pages, must have been badly handled by various quacks, and wishes us to help him expose them, but gives no name and address, that this is not our style of doing business. If he, or any other, has a complaint to make, we must have a

FULL AND SUBSTANTIATED ACCOUNT.

We pay no regard to anonymous letters, and can not make these columns a medium through which to redress private grievances.....Our friend at Oakland, Ill., has fallen in with the enemy, and it is

THE SAME OLD, OLD STORY.

Having some pulmonary trouble, he writes to those quacks, who propose to send a "Recipe Free"—but they take care to accompany the recipe with a circular, saying that their recipe did not do its work, because the herbs, as kept in drug stores, were not fresh. Of course, it follows that the "Doctor" who sends the recipe, can furnish his medicine all right for $3, or some other sum. This is one of the oldest of quack medicine tricks. Our Oakland friend seems to have thought that there was safety in a "multitude of counsellors," so he consulted one quack in Rochester, and another in Philadelphia, each of whom wrote him a letter, which was in both cases the same, word for word, and both of the "Doctors" wind up with precisely the same P. S., except the slight changes noted in brackets, saying: "If you desire [if desired] and [you] will give [send] me your symptoms in full, I will prepare a [the] remedy to suit your special [exact] case."—Perhaps this may be taken as an illustration of the saying that "great minds run in the same channel," but more likely it shows that quacks everywhere are up to the same tricks.

DIPHTHERIA REMEDIES,

In our January number we gave the best possible suggestions we could in regard to Diphtheria, on page 25. On page 8 we advised those who "get an alarming circular headed 'Diphtheria, Suffering and Death,' to put it in the fire," etc. We have been called upon by a gentleman who issues a circular with a similar heading, who brings abundantly signed certificates from judges, clergymen, editors, and other prominent citizens, showing that the physician who gave the prescription for manufacturing the medicine he sells, is of the highest standing and character, and also in commendation of the medicine itself. We accept all these statements, and do not call them in question. The ground we take in regard to this and all similar advertised remedies, is this, that *no* medicine should be advertised and recommended to be used by the public at large, except under medical advice. We exclude all secret remedies of every kind from our advertising columns, and invariably urge our readers to shun *all* such remedies, and to throw all medical circulars of every kind into the fire, without reading, and not have their fears or hopes worked upon. On these general principles, which we act upon always, we wrote what we did last month. Of the particular parties who applied it to themselves, we knew nothing until they presented the certificates above referred to. We have no reason to doubt that the medicine has cured many cases of Diphtheria, and for aught we know, may be the best remedy ever brought before the public; yet we say, neither this nor any other similar or other medicine should be offered to the general public, as this is offered, that is, as a Specific, or Sure Cure, or for universal use, without good medical advice. "What is one man's meat is another's poison."

Catalogues have come in so slowly that our acknowledgments are deferred until next month. Dealers in general, try to have their catalogues ready for February, and as we go to press on the middle of January very few have thus far reached us. To avoid disappointment, we will say that to be noticed in March, all catalogues must reach us by February 12th.

New Spring Wheats.—Mr. Pringle, of Vermont, whose success in producing new varieties of the potato is well known, has been quietly at work for some years past at improving varieties of spring wheat. By continued crossings and selections, he has succeeded in producing varieties, which if they do as well elsewhere, as upon his own farm, can not fail to be of great value. In size of head, and beauty of grain, they are really remarkable.

Maple Sugar.—It is impossible to make the finest product without observing the utmost cleanliness at every step. This should begin with collecting the sap, and the covered buckets made by C. C. Post, Burlington, Vt., will exclude all foreign matter.

The Florida State Fair will be held at Jacksonville on the 12th to 15th of the present month. Our old friend, Doctor J. C. Kenworthy, is President of the Society, and matters are likely to be lively.

Asbestos Paints.—One can not give a final opinion upon a kind of paint until it has been worn for several years. The Asbestos Paints made by the H. W. Johns Manufacturing Co., are a comparatively recent invention, and we have them under trial; thus far we can say that they promise exceedingly well; the colors are of pleasing tints; the paint dries with a smooth hard surface, and, what is of importance to those who use it, it covers well; we have used it upon old and somewhat weather-worn siding, and the man who applied it, being used to painting, called our attention to this fact. We shall use it upon various work, new and old, and report results.

Fine Chinese Primroses.—Whether the amateur has a greenhouse, or cultivates plants in a window only, nothing will afford him more satisfaction than Chinese Primroses. They have the fault of not being readily propagated from cuttings, but this is more than compensated for by the satisfactory results from seed. If one needs cut-flowers, the double whites are among the most useful of white flowers, but if one wishes to make a show on the plant, the single sorts are preferable. With a good strain of seed, each plant as it comes into bloom is a surprise, as they present pleasing difference in foliage as well as in flowers. The finest single Chinese Primroses we have ever seen, were some raised by William Barkham, gardener at Hohokus, N. J., to Jos. Jefferson, Esq., who is eminent in more than one department of art, and whose rural tastes are manifested in Louisiana as well as in New Jersey. Mr. Barkham's plants have elegantly formed leaves, and flowers, some of which are two inches across, with beautifully crimped or fringed edges, and a large, bold, yellow eye, and show by their vigorous development, careful culture.

"Querist," Washington Co., R. I., and 1,492 others. If you do not care enough about your letters to sign them, it is just as well not to write them. New subscribers should understand, what our old friends are well aware of, that we do not notice anonymous letters. We do not publish names, if a wish is expressed that we should not do so. This can be done by signing the letter with whatever name you choose, but the real name must be given to insure attention.

Bommer's Method of Making Manure.—"G. G. P." The method of making manure, detailed in the pamphlet entitled as above, is by no means obsolete, although the book is somewhat old. On the contrary, the practice is very general, and thousands of farmers use some modification of the plan, if not the precise plan itself. The method is valuable and practicable on a small or a large scale, upon every farm in existence.

A Catch Crop of Turnips.—"J. G. Q.," Tioga, Pa., plowed four acres of stubble land after the grain was harvested last summer, brushed in 75 cents worth of flat turnip seeds, and in November pulled 1,310 bushels of turnips, some of them weighing 9¾ pounds each.

"Upland Game Birds and Water Fowl of the United States," by A. Pope, Jr., is the title of a remarkable work now in course of publication by Scribner, Armstrong & Co., N. Y. The work is to be published in ten parts, each part at $2.50, giving two plates 22 x 28 inches, after water-color sketches from life, by Mr. Pope, with descriptive text from the best authorities. We style this as a remarkable work, and it is so in two respects: In the first place it manifests on the part of the publishers a confidence that the public will sustain a really good thing, and secondly, it is remarkable as showing the great perfection to which color printing has reached in this country. The plates are perfect reproductions of water-color drawings, presenting all the breadth and freedom of the originals—indeed there is nothing about them that suggests mechanical work. By all sportsmen and naturalists, the work will be highly esteemed. The plates are well worthy of frames, if one chooses to dispose of them in that manner, or they may be kept in a portfolio, or be bound, as one may prefer. Not only the plates, but the text and cover are marvels of elegance and perfection, and reflect great credit upon the house of Scribner, Armstrong & Co.

Special Fertilizers are now receiving much attention from farmers, and we are in a fair way to soon know how far we can profitably apply fertilizers, specially prepared to meet the particular requirements of various crops. The experiments given by Prof. Atwater on another page, show in a most striking manner the value of experiments in this direction. Those who wish to test the value of fertilizers prepared for special crops, after the method proposed by Ville, and others, will find much to interest them in a recent circular issued by the "Mapes Formula and Peruvian Guano Co.," 158 Front Street, N. Y. City. This circular shows a great amount of pains-taking labor, and gives the requirements as to nitrogen, phosphoric acid, and potash, of each of the leading farm crops, and in another table shows the prices at which these constituents may be supplied. There is no secrecy about these formulas, and one can purchase the special manures ready mixed, or, the constituents of each formula being given, he can procure them in any form he may prefer, and mix them himself.

Nebraska Land.—Attention is directed to the advertisement of lands for sale in Nebraska by a New York gentleman. The party is reliable.

Absorbent for Liquid Manure.—"E. C. N.," Elizabeth, N. J. The method of saving the liquid manure from the stables, and carrying it by drain to a cistern, is to be commended. A convenient manner of using the liquid is by mixing some absorbent material with it. Cut straw, leaves, road sweepings, soda, waste of different kinds, such as that from shoddy mills, or tanneries, and even earth from a garden or a field, all make excellent absorbents. Anything will answer, excepting such as would neutralize the valuable properties of the manure, or would add some injurious constituent to it.

Both Instruction and Amusement, in large amount, will surely be obtained from the *American Agriculturist* MICROSCOPES during this year, by all readers, old and young, who will take a little pains to study *how* to use it. The "Doctor" has begun his lessons, (p.66,) which we advise all to consult and follow out.

Feeding Potatoes to Pigs.—"J. R. M.," New Brunswick, Canada. The plan which we have found as good as any other, if not better, for feeding potatoes to pigs, is to provide a kettle, or boiler, to cook them in, and after the potatoes are roughly washed, if they have much earth adhering to them, they are mixed with corn ears, and the whole is boiled until the potatoes are softened to a mush. This, when cool, may then be fed as it is, or some barley, or oat meal, or bran, may be mixed with it when hot, and left to soak until cool enough to feed. We believe this plan saves one-fourth the value of the feed, which more than pays for the trouble.

Heavy Duroc Pigs.—We lately inspected a shipment of Duroc swine, whose weights were above the average of large pigs. The pig bred by W. M. Holmes, of Greenwich, N. Y., and illustrated in the *American Agriculturist* of December last, was among the number; he weighed 637 pounds, and was 20 months old. 28 carcasses shipped from New Jersey weighed 11,364 lbs.

Best Time to Cut Sprouts.—"H. P.," Georgetown, Texas. Sprouts from the roots of trees should be cut when in full leaf and vigor; the shock is then generally fatal to them.

Yield of Corn Fodder.—"R. M.," Pittsfield, Ohio. 2,000 lbs. of corn fodder for 10 bushels of corn is a fair average estimate. The average yield of corn is 30 to 40 bushels per acre, and the crop of stalks should amount to 3 to 4 tons per acre. Where the crop of corn is above the average, this estimate should be modified; as where 60 to 80 bushels per acre is produced the proportion of stalks would be probably not more than one ton to 15 or 20 bushels of corn.

Curing Hay in Pits.—"J. A.," Chehalis Co., W. T. In a moist climate where it is difficult to cure hay, the plan of preserving it by ensilage, as described in the *American Agriculturist* for June, 1875, may be adopted. This plan, if the directions given are properly carried out, will be successful. It is now practised by hundreds of large farmers in Germany and France, for the curing of green corn stalks, clover lucern, and leaves of beets, and is also in use for keeping brewer's grains in this country, by some prominent dairymen.

The N. J. State Horticultural Society will hold its next Annual Meeting in Geological Hall, at Rutgers College, New Brunswick, N. J., on Feb. 6th and 7th. An interesting programme for papers and discussions is offered. "All interested are invited."

Which is the Best Single Book for a Farmer?—While we think that every farmer may profitably invest in a library of moderate size, we are often called upon to answer the question proposed above. In giving a reply, we have to consider the wants of two classes. One, the average farmer, brought up to his occupation, but who wishes a work which he can consult upon matters in which he has had no experience. The other, the novice in farming, who would have some general guide which he can safely follow. We know of no work that will meet the wants of both these classes so well as the "*New American Farm Book*," originally by R. L. Allen, one of the founders of the *American Agriculturist*, and later revised, enlarged, and brought up to the times by his brother, Lewis F. Allen, well known as an authority on agricultural matters. This work covers the whole routine of ordinary farming. Of course if one makes a specialty of cattle, sheep, swine, or such crops as hops, broom-corn, etc., he will naturally procure works on these particular topics, but we know of no book that so thoroughly meets the wants of the general farmer as this. A glance at its contents shows that while all ordinary farming topics are treated in a satisfactory manner, sufficient is given upon special crops to give one an idea of their culture. Soils, their improvements, and their mechanical working, and manures of various kinds, and their uses, are discussed without introducing confusing scientific terms. Grasses and clover, being the groundwork of successful agriculture, have an important place; these are naturally followed by the various grains, root crops, and the different forage plants. The orchard, as an important part of every farm, has a chapter, while fences, hedges, roads, farm-buildings, timber-lands, cisterns—indeed, almost every thing belonging to a farm is treated plainly and in full. All the domestic animals, including poultry, with their management and their diseases, including their products, whether of the dairy, or their flesh when slaughtered, are treated of in a condensed, but most comprehensive manner. Not the least useful portion of the work is the tables, which give those things that one finds it so difficult to carry in mind, and equally difficult to find just when the information is needed—such as the amount of different farm seeds to sow to the acre; the number of trees or plants required for an acre at different distances apart; the comparative value of different foods; bulk of a ton of different articles; weight of a bushel of grains; contents of cisterns; value of fuel; composition of various agricultural products, etc. To those who, like the writer, do not dare to trust to memory for such data, a work of reference of this kind is of the *greatest value*. We cannot recollect having consulted this work on such matters without finding just the information we sought. It comes the nearest being an Encyclopedia of Agriculture of any work in the language. For the great variety of topics, the clearness of its teachings, and for its directness, we feel warranted in commending Allen's "New American Farm Book" as the best single work for the American farmer, and we are sure that it will prove to every one of a value *far above its cost*. It is a large 12mo. volume or over 500 pages, in clear type. It will be sent from this office, post-paid, for $2.50.

Farmers Who Live Near Cities or large towns, especially if these have a manufacturing population, can not afford to continue the old style of farming, and get only small crops of corn, potatoes, and hay to the acre. If the growth of towns and cities increases the farmer's taxes, it also enlarges their opportunities, by offering a market for certain crops, and at the same time affording a supply of manure. One used to the routine of the farm may not care to go into the details of market-gardening, where perishable crops must be marketed daily. But there is a medium between regular market-gardening, and the ordinary routine of farming, which is termed "*Market Farming*." This differs from market-gardening, in raising but a few of the less perishable crops, and from regular farming, in requiring higher culture, the sale of the crops, and the buying of manures. The farmer who lives within ten miles of a large manufacturing town makes a great mistake if he does not consult the wants of that place, and supply them. Take two crops for example—carrots and cabbages. In any large place where many horses are kept, there is a good market for carrots, and there is generally a ready sale for them, to be delivered direct from the field. Working people, such as factory operatives, know the nutritive value of cabbages, and these always meet with a ready sale in such places. Either of these crops is easily managed, and is sure to bring a larger profit than any regular farm crop. While market-gardening has been over-done in the vicinity of some large cities, there are many smaller places where it may be profitably undertaken, to supply the home market, and farmers' sons, instead of looking for work in the cities, had better buy Peter Henderson's "Gardening for Profit," and go to work at supplying the wants of the nearest towns. To those who would raise some of the less perishable crops, like those we have mentioned, we also commend P. T. Quinn's "Money in the Garden," and Frank Brill's "Farm Gardening and Seed Growing." The first two are sent post-paid from this office for $1.50 each, and the last named for $1.00. Any farmer near a large town, can profitably invest in all three of these works. Though on similar subjects, each has its peculiar features, and is well worth the price to any cultivator of the crops on which it treats.

Basket Items continued on page 73.

Important Farm Experiments.

Most soils, after a few years cropping, begin to lose their fertility. This is because the crops have taken away more of certain of the ingredients of plant-food than the soil has been able to re-supply. Barn-yard manure, which contains all the elements of plant-food, is usually employed to restore the lost fertility. But there is not half enough manure produced to give the renewed or increased fertility needed for the greatest profit, except on farms where a good deal of live stock is kept. Other fertilizers are needed for the most profitable farming. What shall they be? Farmers have been groping in the dark, trying guano, phosphates, bone, poudrettes, and what not, without knowing either what their soils and crops needed, or what the fertilizers supplied. And it is a fact that a very large part of the cost of all such applications has been wasted—an immense sum, certainly millions of dollars in the aggregate,—because many of these fertilizers have proved, if not really worthless, at least not the thing needed—and others, while supplying the needed elements for the soil or crop, have furnished, at much cost, a large amount of material, valuable in its place, but not needed by the particular soil to which they were applied. Prof. Atwater, in his articles published in the *American Agriculturist*, during three years past, has been urging farmers, each for himself and on his own particular soil, and before investing largely in commercial fertilizers, to *address questions to their individual soils* in the form of experiments on a small and inexpensive scale, but so carefully that the questions would be answered. There is no doubt that this is the best way. A few experiments, with fertilizers costing $5 to $10, much if not all of which will be returned in the crop, will do more to tell the farmer what *his* soil needs, than $500 or $1,000 spent in analysis of the soil.—Such experiments have been recommended over and over again, by the leading agricultural chemists in Europe and America, and have been carried out by practical men with the greatest profit. They are rational, simple, easy, and cheap. To facilitate their introduction last season, samples of fertilizers of tested qualities, were sent out, at cost price, $4.50—$6.00 per set, from the Agricultural Experiment Station, at Middletown, Conn. Prof. Atwater gives some of the results elsewhere, (page 50.) For farmers to get samples of genuine fertilizers, with explanations of their composition and use, at such low cost, was something; to have the offer to test the fertilizers, and with them their soils, was more. Numerous reports from the men who have made the experiments, and are more than pleased with the results, attest their utility. These experiments ought to lead many other farmers to make similar ones. To aid them in so doing, there is talk of making arrangements to supply the subscribers of the *American Agriculturist*, who may wish them, samples of fertilizers for the coming season, as was done by the Connecticut Station last year; but no plan has yet been adopted, and may not be. If this is arranged for, it will be announced in our next paper.

American Cheese—Foreign Demand.

The broad pastures of our vast country are rapidly becoming feeders of Europe. The year just past has witnessed an increase of several hundred per cent in the export of fresh beef and mutton, mainly produced on the grass-growing and corn-producing Western prairie lands; and it only requires the general introduction of Short-horn blood among Western cattle to extend this export of fresh beef in the carcass, and of live beef cattle, to an immense amount. As *fresh* meat can now be taken from the Atlantic seaboard, and laid down in good condition in the chief seaports of Western Europe at small cost, we only need to produce *good* beef, to be able to compete successfully in the meat markets of the Western portions of the Old World.

But the South and the far West are not alone yielding exportable products. Large quantities of Cheese to meet a foreign demand are produced in the Middle States, as well as in several of the Western States. The following figures, from the U. S. Bureau of Statistics, shows a wonderful increase in the

EXPORT OF CHEESE TO FOREIGN COUNTRIES.

1860	15,515,799 lbs.	1869	39,960,367 lbs.
1861	32,361,428 "	1870	37,296,327 "
1862	34,052,678 "	1871	63,698,867 "
1863	42,045,054 "	1872	66,304,025 "
1864	47,751,399 "	1873	80,366,640 "
1865	53,098,468 "	1874	90,611,077 "
1866	36,411,985 "	1875	101,010,852 "
1867	52,352,127 "	1876	97,676,264 "
1868	51,097,203 "	1877	107,364,666 "

Bee Notes for February.

BY L. C. ROOT, MOHAWK, N. Y.

If all the proper requirements may be observed without disturbing bees during this month, it will be desirable. I found, by a quiet examination in my bee cellar a few days ago, that mice had found their way into the place, and were disturbing the bees by making their nests in the cotton quilts directly over the clusters of bees, where they found it very warm and comfortable. This may be agreeable to the mouse, but is not conducive to the quiet desirable for the bees. The mice may be easily caught by baiting an ordinary trap with cheese.... For hives wintered out of doors, follow directions given last month.

I propose to give, during the present winter, the respective amounts of honey consumed by four hives of bees each month. I have left one swarm on its summer stand, to show the difference in the amount required when bees are wintered out of doors, or when properly wintered in a well-arranged in-door repository. During the month of December, three swarms in the cellar consumed honey as follows:—No. 1, ½ lb.; No. 2, ¼ lb.; No. 3, 1¼ lbs. No

3 is a very heavy hive, and in order to test the desirability of having swarms numerous in bees, I united four swarms before placing them in winter quarters. It should be borne in mind, by those who note these results during winter and spring, that this swarm commences the winter with four times as many bees as each of the other three. No 4, which is the hive out of doors, consumed 4¼ lbs. No. 1, and No, 4, are both Italian swarms, and are, as far as I can determine, in nearly every way about equal. Yet the latter, being exposed to out of door changes of temperature, consumes 4¼ lbs., while the former takes but ¾ lb. This should be a point of interest to advocates of out-door wintering.

Review of the Live Stock Market for 1877.

The history of the live stock market for the past year has been an eventful one. The first six months of the year witnessed a slow but steady trade without serious fluctuation in prices. Then came the great strikes on the railroads which seriously interfered with business. For two weeks trade was practically dead, only a few poor local supplies furnishing stock for the butchers. Prices, however, only advanced to 14¼c. per lb. which was the highest point reached. From this time, onwards the business has been dull in the extreme and dealers and wholesale butchers, including those operating in the foreign shipments, lost heavily. Many failures occurred and business has been much depressed. The monthly sales of beeves for the year have been as follows:

Month.	*Number Sold.*	*Prices.*
January,	46,045	8c. @ 13c. per lb.
February,	36,036	7c. @ 13c. "
March,	37,542	7¼c. @ 12¼c. "
April,	40,639	7c. @ 12¼c. "
May,	52,877	8¼c. @ 12¼c. "
June,	39,241	8¼c. @ 13¼c. "
July,	45,776	7c. @ 13¼c. "
August,	38,487	7c. @ 14¼c. "
September,	30,824	7¼c. @ 13c. "
October,	50,287	6¼c. @ 13c. "
November,	36,379	7c. @ 12¼c. "
December,	35,901	6c. @ 13c. "
Total,	489,133	
Weekly Average,	9,406	

The sales of stock other than beeves have been:

	Total.	*Weekly Average*	*Range of Prices.*
Cows,	2,654 head.	51	$22 @ $90 per head.
Calves,	202,754 "	1,976	Calves, 3c. @ 6¼c. per lb. Veals, 7c. @ 9¼c. "
Sheep & Lambs,	1,163,339 "	22,311	Sheep, 4c. @ 10c. " Lambs, 5c. @ 13c. "
Swine,	1,144,195 "	13,003	Live, 4¼c. @ 7¼c. " Dres'd, 5¼c. @ 8¼c. "

The foreign shipments of meats and live beeves and sheep, increased largely up to the fall months when the failure of several of the large operators showed the truth of what we have frequently stated as our opinion, viz: that the export business can never become anything more than a spasmodic affair, flourishing when prices are low and stocks heavy here, and when stocks are light and prices high on the other side. The expenses and risks are too great, and the profits, when any are made, are too small to sustain a steady trade. It may answer as a safety valve to relieve pressure here, but as soon as the pressure is relieved the movement must cease. We may build up a business in the course of years, but not until beeves bear a lower price here than we hope to see.

Instructive Notes about Switzerland.—How few have any very definite idea of our little Sister Republic in the Old World. Here are a few items for the readers of the *American Agriculturist*, which Mr. Judd has boiled down from his traveling Note Book.—Switzerland is a *northern* country, though it does not look so on the map; it is on a line east of Lake Superior, or Quebec, (lat. 46 to 48°). It is a *high* country, very little of its surface being less than 1,500 feet above the sea level. Many of its mountains are over a mile (5,280 feet) high; 38 of them over 6,400 feet; 29 are over 10,000 feet high, that is 2 miles and more; 8 are 13,075 to 15,150 feet high.—Switzerland's greatest length is 210 miles; greatest breadth, 140 miles; total area, 15,747 square miles, or one-third as large as New York State, or about twice as large as New Jersey or Massachusetts. Its people numbered in 1870 2,669,247, or about the same as in Ohio, or in Illinois. Of these, about seven-tenths speak German; over two-tenths French, the rest speak Italian. They live in 22 cities and towns, 63 hamlets, and 6,800 villages. Over 350,000 children are taught in nearly 6,000 public schools. There are about 200,000 fighting men, viz.: 85,000 belonging to the field army; 50,000 reserves; 65,000 militia. The public revenue and expense is only about 4½ million dollars, or one-sixth as much as that of the City of New York alone. Its valleys and hill-sides are largely in pasture lands, supporting 993,000 horned cattle, 100,000 horses, 447,000 sheep, 375,000 goats, and 304,000 swine.—The Government is somewhat like our own: The NATIONAL COUNCIL, corresponding to our House of Representatives, contains 135 members, about one for every 20,000 inhabitants, elected by the people once in three years. The COUNCIL OF STATES, corresponding to our U. S. Senate, contains two members for each Canton. These two bodies together are called the "Federal Assembly," corresponding to the United States Congress, which is made up of our Senate and House of Representatives. The NATIONAL COUNCIL elects a President and Vice President at every regular and every extraordinary session, who are the chief officers of Switzerland during their term of office. The President can not be re-elected at two consecutive sessions of the National Council. The National Council, and Council of State, in joint session, elect, once in 3 years, 7 Executive Officers of the General Government, corresponding to our Secretaries of State, Treasury, War, Navy, etc. These, acting together, are called the FEDERAL COUNCIL.—The 22 Cantons and 6 Half Cantons of Switzerland, correspondin[illegible] on a smaller scale, to our States, have their local governments, making local laws, etc., similar to our State Legislatures.

Science Applied to Farming.—XXXVIII.

Scientific Experimenting by Practical Farmers—Testing the Needs of Soils by Trials with Fertilizers.

As explained in the article of this series for April, 1877, there were sent out from the Experiment Station here, last spring, to farmers in Connecticut and other States, nearly 50 sets of fertilizers, with explanations and directions for experiments. With them were blanks on which those who might be willing to take the needed trouble in measuring plots and crops and noting observations and results, were requested to make out reports, and return them to me. To tell the truth, I did not expect many reports. Much to my surprise and gratification, nearly twenty have sent more or less detailed accounts of their experiments. All are interesting and instructive—some particularly so. As an application of science to farming by practical men, who get their living from the labor of their brains and hands upon their farms, and who have found in them a means of testing the needs of their soils, and the ways of supplying them, I am sure these results will be widely welcomed.

The principle upon which these experiments are based is, in brief, this:—The chief office of fertilizers is to supply the plant food that our crops need, and which the soils fail to furnish. It is not good economy to pay high prices for materials which the soil may yield in abundance, but it is good economy to supply the lacking ones in the cheapest way. The most important ingredients of our common commercial fertilizers, are *Nitrogen, Phosphoric acid, and Potash*, because of both their scarcity in the soil and their high cost. It is in supplying these that guano, phosphates, bone manures, potash salts, and most other commercial fertilizers are chiefly useful. To test the needs of the different soils with reference to these substances, was the special object of the experiments, though the action of different fertilizing materials with different crops was also to be tested. The table below gives the compositions and costs of principal materials used.

Experimental Fertilizers.

Number of Bag.	Fertilizer Used. Kind.	*lbs. per Acre.*	*At price ₱ ton.*	*Cost per Acre.*	Furnishing Valuable Ingredients. Kind.	*Assumed per cent.*	*lbs. per Acre.*	*Cost per Acre*
I.	Dried Blood	320	$40.00	$6.40	Nitrogen	10	32	$6.40
II.	Superphosphate *	320	$35.00	$5.60	Phosphoric Acid †	16	51	$5.60
III.	Potash Salt, "Muriate."	320	$45.00	$7 20	Potash	50	160	$7.20
IV.	Dried Blood	160	$37.50	$6.00	Nitrogen	5	16	$3.20
	Superphosphate	160			Phosphoric Acid †	8	25½	$2 85
V.	Dried Blood	106⅔	$40.00	$6.40	Nitrogen	3.3	10⅔	$2.13
	Superphosphate	106⅔			Phosphoric Acid †	5.3	17	$1.87
	"Muriate of Potash."	106⅔			Potash	16.7	53⅓	$2.40

* From bone-black. Some of the best "ammoniated" superphosphates are made of bone-black superphosphate, and dried blood. † In soluble form. The prices above, for cash, are, if anything, too high for the present state of the market. The 50 per cent "muriate" of potash, for instance, has been sold extensively in this region for $40.00 per ton, plus freight from New York.

Besides the articles in the table, a number of others, as Plaster, Nitrate of Soda, Ground Bones, and Peruvian Guano, were supplied to those who wished them. They were all of the best quality, as tested by analysis at our laboratory. Each one was contained in a bag of 20 lbs., on which the name and composition were marked. The several small bags were packed in one large bag, and with them were sent printed explanations and directions for using. With other suggestions, was one that parallel trials be made with other fertilizers. I give some of the experiments herewith, reserving others, with recapitulation and conclusions, for a succeeding article. The reports are essentially as they came to me; a few changes in form being made for the convenience of the printer.

Experiment with Corn by Mr. D. H. Birdsey, Middlefield, Conn.

Soil: Upland, gravelly loam, with gravelly subsoil. *Previous treatment:* Had been in grass for three previous years. Yield of hay estimated at ½ to ¾ ton per acre. Last manuring was (with oats) leached ashes; previous to this, barn manure and bone. *Size of each plot:* 10 square rods. *Amounts of Fertilizers:* Plots **1—5,** 20 lbs. each; Plot **6,** yard manure, 5 cords per acre, with hen manure and ashes in the hill. *Amount of Seed:* 5 quarts per acre. *Distance between hills:* 4 feet each way. *Planted* May 15. *Harvested* Oct. 26. *Yield* (corn in the ear, measured in bushel basket) as below.

No. of Plot.	1	2	3	4	5	6
Kind of Fertilizer.	*Dried Blood.* I	*Superphosphate.* II	*Potash Salt.* III	*Mixture.* I+II	*Mixture.* I+II+III	*Yard and Hen Manure and Ashes.*
Important Fertilizing Ingredients.	Nitrogen, N	Phosph. Acid. P_2O_5	Potash. K_2O	$N+P_2O_5$	$N+P_2O_5+K_2O$	Co'pl'te Fertilizer.
Yield. Corn in the Ear.	2½ bu.	2½ bu.	6 bu.	2½ bu.	6 bu.	5½ bu.

Mr. Birdsey says in his report that "on Plot **3,** with potash-salt, **5,** with dried blood, superphosphate, and potash-salt, and Plot **6,** with yard and hen-manure and ashes, (which also furnished potash,) the crops looked well through the season; the stalks were strong, and large, the ears well-filled, and the grain good. On the others (without potash) the growth was very poor, the stalks small, weak, and yellow, and the ears poorly filled—mostly 'nubbins.'.... The potash worked wonders wherever it was put." He adds that "on this land, bone formerly brought good crops; with rye, about all the land would hold. But of late years bone does very little good, and don't pay. The same is true of phosphates." This is only one of a considerable number of cases I have observed in this region in which lands where bone, phosphates, guano, and fish, supplying phosphoric acid and nitrogen, have nearly ceased to do good, and potash salts have proved very beneficial. We have had two bone mills in the vicinity for a good while. Fish-scrap is cheap, and our farmers have used a good deal of guano and phosphates. It would seem as though some of our fields had become relatively overcharged with nitrogen and phosphoric acid, and deficient in potash. It is noticeable in Mr. Birdsey's experiment that: (1) on the three plots which had no potash the crop failed; (2) on the three, where potash was applied, they were good; (3) the crop with potash alone (No. **3**) was as good as those with potash and other ingredients together, (Nos. **5** and **6.**) It certainly looks very much as though this soil had enough of other materials than potash for the present supply. Mr. Birdsey has since bought the 50 per cent muriate of potash at $42 per ton, delivered here. At this rate, the dressing of

Experiment with Corn, by Mr. W. I. Bartholemew, Putnam, Conn.

Soil: Hill land, surface, dark loam, moist, with clayey sub-soil.—*Previous Manuring and Produce Per Acre:* 1874, No manure; hay, 1 ton. 1875, Barn-yard manure, 12 cart loads; corn, 35 bushels. 1876, No manure; oats, 40 bushels.—*Experimental Crop,* 1877: White Cap Corn.—*Size of Each Plot:* 10 square rods.—*Amounts of Fertilizers Per Acre:* Experiment Station fertilizers and superphosphates, 320 lbs.; unleached ashes, 32 bushels; leached ashes, 48 bushels; hog-manure, 16 cart-loads; hen-manure, 20 bushels; night soil, 32 bushels.—*Fertilizers applied in the hill.* The dried blood and potash salts were scattered over more than a foot square in each hill, and covered with fine earth before dropping the corn.—*Hills:* 3½ feet apart each way; 4 kernels in each hill.—*Planted:* May 15.—*Harvested:* Oct. 10.—*Quality of Crop:* As stated in table, "the corn grown by the use of hog-manure and, especially, night-soil, was much injured by mould. The husks and corn were, in some cases, completely rotted with it."—*Amount and Value of Yields:* "70 lbs. of the best yields make a bushel of shelled corn, which is reckoned [in table] at 70c. per bushel. The smaller yields were greener in the cob and corn, and are hardly worth the price affixed, but I concluded to give the exact yield in pounds, and have computed yield and value per acre from actual weight in each case. [Multiplying amount in each plot by 16.] No allowance is made for worth of fodder, which was, on the different numbers, very nearly in the same relative proportions as the corn.—*Cost of Fertilizers:* [Those from Experiment Station, per table above.] "The price of superphosphates depending upon distance from market, I have reckoned all at cost at R. R. Station. [In estimate of gain from use of fertilizer, the omitted value of stalks would more than pay for carting and applying.] "I have placed no prices upon the manures from the farm, as their cost is uncertain, but I am certain that the expense of carting the hog-manure to the field, and applying it, is equal to cost of phosphates in either instance."

Number of Plot.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Fertilizers Applied.	Fertilizers from Experiment Station.						No Manure.	Commercial Superphosphates, "Ammoniated."				Wood Ashes.		Farm-made Manure.			
Kinds.	*Dried Blood.* I	*Sup'rp's phate.* II	*Potash Salt* III.	*Mixture* I+II.	*Mixt* I+ II+III.	*Plaster.*		*Lister's.*	*Whanns*	*Russel Coe's.*	*Bos-worth's.*	*Dry.*	*Leached*	*Hog Manure.*	*Hen Manure.*	*Hen M'e +Pl'st'r*	*Night Soil.*
Amounts.	20 lbs.	20 lbs.	20 lbs.	20 lbs.	20 lbs.	20 lbs.	——	20 lbs.	20 lbs.	20 lbs.	20 lbs.	2 Bushels.	3 Bushels.	1 Cart-load.	5 Pecks.	5 Pecks +5 lbs.	2 Bushels.
Furnishing Ingredients.*	Nitrogen. N.	Phos. Acid P_2O_5	Potash. K_2O.	$N+P_2O_5$.	$N+P_2O_5+K_2O$.	(1)	——	$N+P_2O_5$.	$N+P_2O_5$.	$N+P_2O_5$.	$N+P_2O_5$.	(2)	(2)	(3)	(3)	(3)	(3)
Hight July 1st, in inches.	13 inch.	31 inch.	10 inch.	20 inch.	16 inch.	12 inch.	11 inch.	29 inch.	27 inch.	31 inch.	25 inch.	14 inch.	15 inch.	18 inch.	22 inch.	22 inch.	23 inch.
Appearance of Crop at Harvest.	Small.	Average	Small.	Little below average.		Small.	Small.	Average	Average	Little above average	Average	Little below average.		Average	Above Average	Above Average	Above Average
Yield: Ears of Corn.....	60 lbs.	182 lbs.	68 lbs.	166 lbs.	146 lbs.	85 lbs.	74 lbs.	176 lbs.	178 lbs.	192 lbs.	180 lbs.	153 lbs.	165 lbs.	180 lbs.	240 lbs.	248 lbs.	230 lbs.
Appearance of Corn harvested.	Very poor a'd green.	Sound and ripe.	Very poor a'd green.	Sound, ears short.	Sound, ears shorter.	Very poor.	Very poor a'd green.	Sound and ripe	Sound and ripe	Sound and ripe	Sound and ripe	Sound.	Sound.	Little mouldy.	Very sound.	Very sound.	Very mouldy.
Increase in Yield.†.....	—14 lbs.	108 lbs.	—6 lbs.	92 lbs.	72 lbs.	11 lbs.	——	102 lbs.	104 lbs.	118 lbs.	106 lbs.	79 lbs.	91 lbs.	106 lbs.	166 lbs.	174 lbs.	156 lbs.
Value of Increase‡ per Acre.	$2.24.[4]	$17.28.	.96.[4]	$14.72.	$11.52.	$1.76.	——	$16.32.	$16.64.	$18.88.	$16.96.	$12.64.	$14.56.	?	$36.56.	$37.84.	?
Cost of Manure per Acre.	$6.40.	$5.60.	$7.20.	$6.00.	$6.40.	$1.50.	——	$6.40.	$6.40.	$6.40.	$6.40.	$7.20.	$7.20.	?	?	?	?
Gain (or Loss)‡ per Acre.	$8.64.[4]	$11.88.	$8.16.[4]	$8.72.	$5.12.	$0.26.	——	$9.92.	$10.24.	$12.48.	$10.56.	$5.44.	$7.36.	?	?	?	?

* That is, the most valuable fertilizing ingredients. (1) Plaster consists chiefly of Sulphuric Acid and Lime. (2) Ashes contain all the ingredients of plant-food, but Nitrogen. The leached have but little Potash. (3) Contain all the ingredients of plant-food. † Increase (or decrease) as compared with No. 7, unmanured. ‡ Reckoning Corn at 70 cents per bushel. (4) Loss.—The Ammoniated Superphosphates contained 9 to 12½ per cent of availble Phosphoric Acid, and 2 to 2½ per cent of Nitrogen.

his experiment, 320 lbs. per acre, would cost $6.72. He calculates that the stable manure of No. **6** cost $40 per acre, besides the ashes and bone. He says that on the strength of this experiment he has bought several tons of potash salts and I learn that several of his neighbors have followed his example. In respect to the potash salts doing so well alone, this experiment is exceptional. I should not wish to invest too heavily upon the strength of a single experiment, on one field, with one crop. That potash is most wanted in that soil, I have no doubt. But in the next field the case may be different. As Mr. Birdsey's is one of the simplest, Mr. Bartholemew's is one of the most extensive experiments reported:

In Mr. Bartholemew's experiment, the following points are noticeable:—(1.) In the four cases, Nos. **1, 3, 6,** and **7,** where phosphoric acid was not supplied, the crop failed. (2.) In every case where phosphoric acid was supplied, either alone, (*i. e.*, as superphosphate with the lime and sulphuric acid incident thereto,) in No. **2,** or with some, generally little, nitrogen, in Nos. **2, 5, 8, 9, 10,** and **11,** the crop was good. (3.) The amounts of phosphoric acid per acre in Nos. **2, 4,** and **5,** were 51, 25½, and 17 lbs., respectively; the yields, 182, 166, and 146 lbs. show a corresponding decrease. Comparisons of the amounts of phosphoric acid applied, and corn produced in the other cases, of which limited space excludes details, show a similar and singularly uniform ratio between the two. This parallelism between phosphoric acid and yield, runs through the plots with ashes which contained less of the acid, and brought less corn; and those with farm manures, which contained more, and brought more. (4.) The yield with potash-salt, and with dried blood alone, was less than on the one plot with no manure. (5.) While the crop responded uniformly to the phosphoric acid, it got no apparent benefit from the other ingredients of either the chemical fertilizers, the ashes, or the farm manure. (6.) As indicated by the money costs of fertilizers applied and corn produced, there was uniformly a gain of from $10 to $12.50 per acre from phosphoric acid alone or with a little nitrogen, a smaller gain in each case where phosphoric acid was supplied with other substances, and, in every case where it was omitted, a loss. What that soil needs most, is clearly phosphoric acid.

This report of Mr. Bartholemew's experiment with fertilizers, is one of the best I have seen from a private farmer in this country. If his farming is equal to his experiments, and there are many others in that region like him, it is easy to see why the Woodstock Farmer's Club, of which I hear he is a member, and the farming thereabouts, stand in such excellent repute.

W. O. Atwater,
Wesleyan University, Middletown, Conn.

Requisites for an Ice-House.—Ice may be kept under any circumstances, and in any kind of a house, if the following conditions are secured and maintained. The floor upon which the ice is packed, must be perfectly well drained, and closed against access of air. The ice must be in a sufficiently large body, at least 8 feet wide each way, and be stowed compactly, without air spaces between the blocks or layers. If spaces between the blocks can not be avoided, these should be closely filled with pounded ice. The ice should be cut and packed on a dry, cold day, when the blocks will freeze solidly together. There must be a perfectly air-tight, or non-conducting packing, around the ice, of at least one foot in thickness. Dry sawdust is the best material for packing; waste tan bark is nearly, if not quite as good. There must be ample ventilation above the ice, to carry off the dampness which will arise from the packing. The evaporation of the moisture from the upper packing by a brisk current of air, appreciably reduces the temperature. The most frequent causes of failure in keeping ice are, the entrance of air from beneath; the presence of water at the bottom which can not escape, imperfect packing, and too close confinement above.

The N. Y. State Dairymen's Association, held its Annual Convention at Syracuse, on December 18th. The Hon. Harris Lewis, the President, remarked, in his address, that the past year's success could only be repeated in the coming season, by making every effort to supply all deficiencies in methods, practice, and appliances, and to bring a proper enthusiasm to bear upon the dairy business. He thought that those young men who left the farms to go to the cities, because farming was distasteful to them, did well, for if they staid on their farms the sheriff would surely sell them out in time. A love for one's business, be that what it may, is essential to success. The reading of several practical papers, and a visit to the salt works at Salina, occupied the two days of the Convention.

The Utility of Dairy and Other Exhibitions.—Many farmers, dairymen, and others, engaged in different branches of agriculture, not to speak of various artisans and manufacturers, are inclined to consider exhibitions of their products a useless and expensive trouble. This idea is a mistaken one, as the direct results of these exhibitions are very valuable, and their indirect influence, equally, if not more so. The public are made aware of the existence of many things heretofore unknown to them, and thus consumption is largely increased; the close comparison of the work of different producers, and the ambition engendered by this, tend greatly to an increased excellence in the products, and many new ideas are gained. There are other advantages besides these, but if these were all, they would be sufficient inducement to make these exhibitions desirable, not only to those most closely interested, but to the general public. As an illustration, may be cited the case of a dairy exhibition held annually at Frome, in England, where cheese to the yearly value of five millions of dollars is made. The result is, that since 1870, when the first show of cheese was made, an improvement in quality, estimated at 50 per cent, has been made, and the yearly returns to the district have increased a million dollars.

Tree Scraping and Tree Scrapers.

BY L. D. SNOOK, YATES CO., N. Y.

If orchards were properly cared for, there would be no need of tree-scrapers, but with this, as with pruning, it is a too frequent practice to allow the trees to get in as bad a condition as possible, and then to have a serious time at pruning, scraping, and renovating generally. If our yearly advice, to give the trees each spring some alkaline wash, were regarded, there would be little use for the scraper. If one once puts the trunks of his trees in healthy condition, they look so much better, and really are so much more healthy and thrifty, that we are quite sure that he will not omit the slight yearly labor required to keep them in this condition. If one has a neglected orchard, he should not let this spring go by without an attempt to renovate it. Old trunks covered with loose scales of bark, and coated with lichens and mosses, should have in the first place a thorough scraping, and this should extend along the larger limbs so far as is necessary. After this scraping they should receive a strong alkaline wash. There is nothing, to our notion, so good for this purpose as good home-made soft-soap, made from ley (or potash) and grease. The boughten soft-soap is mainly a fraud, it being only cheap hand soap made into a sort of jelly with water. If good home-made soft-soap can be had—

and it should be obtainable on every farm—mix it with enough water to make it so thin that it will apply evenly with a brush. It may be necessary to use hot water, and it should be only so diluted that it will work readily. Use a white-wash brush, or large paint brush, and lay it on well upon the trunk or the larger branches. The best time to do this is in the long, damp, and foggy spells that are common in February and early March. The soap liquid will not dry soon, but have several days to act before it is washed off by the rains. If the genuine home-made soap is not to be had, then use a wash made of potash—a pound to the gallon of water—and apply it in a similar manner. The advice occasionally given to make a wash by heating sal-soda, and then dissolving it, is simply nonsense. Sal-soda is not rendered caustic by heating, and it is no different when dissolved, than the same would have been without heating—nothing but water having been expelled. But we started to describe Mr. Snook's scrapers. He says:—"That in figure 1 has a movable handle from a foot and a half to three feet in length, the latter length being required for tall trees. The scraper is a piece of steel, about five inches square, two sides being straight, while the other two sides are hollowed out, so that it may the more readily adapt itself to the surface trunk, and the curves should be of different sizes, one to suit the trunk, and the other the branches. Another form is shown in figure 2; one of the sides being straight, while the other two sides of triangle are curved for the purpose just mentioned. A hole is made through the center of both scrapers, which are secured to the handle by a threaded bolt (fig. 3,) one-half an inch in diameter, and four inches in length, to the end of which is welded a piece of iron, one and a half-inch square, and one quarter of an inch thick. This bolt, when screwed into end of the handle, will hold either of the scrapers firmly in position.

Fig. 1.—TREE SCRAPER.

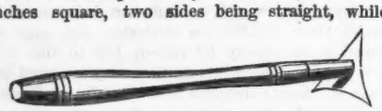


Fig. 2.—TREE SCRAPER.

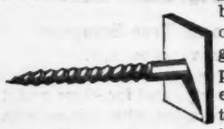


Fig. 3. BOLT FOR SCRAPER.

A Country House, Costing $550 to $700.

BY S. E. REED, ARCHITECT, CORONA, LONG ISLAND, N. Y.

This is one of four plans given consecutively, in response to many calls for "very low-priced houses."—It will accommodate a small family well, and has a pleasing appearance....**Exterior,** (fig. 1.)—The Front has sufficient variety of parts to insure a fair degree of picturesque effect. An allowable amount of neat tracery is admitted in the composition of the gables, and between the piazza columns, to give an expression of taste, and cheerfulness. More than this would not accord with the utility and economy especially aimed at in these plans. If intended for a Summer Cottage, or Gate Lodge, for persons of larger means, the matter of exterior dress would assume quite a different aspect, and admit of more liberal treatment ...**Ground Plan,** (fig. 2.)—The arrangement shown is adapted to an *Eastward* frontage, placing the Entrances and the Living-Room on the pleasant side where least exposed to northerly winds, and cold. Should an opposite frontage be selected, the plan may be suited to it by reversing the sides, as this would be reflected if held before a mirror. The hight of the ceilings is 10 feet. The front entrances open directly from the piazza to the Parlor and Living-Room. These entrances may be protected in winter by a sash inclosure, forming a pleasant vestibule of a part of the piazza. The principal rooms are a Parlor, Kitchen, and two Bedrooms. The Parlor is in front of the main building, and of sufficient size for the ordinary uses of such an apartment. The Kitchen is intended as the Living-Room, where the family maintaining the simplicity of cottage life, spend much of their indoor time, sharing together the domestic cares and comforts. It is sufficiently spacious to admit of the requisite furniture, and allow of the ordinary family gathering without crowding. It has three windows; if desired, the upper part of the front door may have sashes, giving views in three directions. The pantry, and lobby, at the rear, are of equal size, both opening from the kitchen. The two Bedrooms adjoin each other, (but have no communication between them in the plan. This may be arranged as desired.) One opens from the parlor, the other from the kitchen, and each has a closet. The chimney is placed between the kitchen and parlor, with an open fire-place on the kitchen side. The method of heating, described in last December *American Agriculturist*, would insure the comfortable warming of both of the principal rooms from one kitchen fire....**Cellar,** (fig. 3.)—Hight, 6½ feet. The dimensions embrace the space below the kitchen and the bedrooms (the part under the parlor is unexcavated); it has three windows, and an outside entrance....**Construction.**—The foundation walls are of broken stone and mortar, and show 2 feet above ground. Those under the parlor are laid in trenches, extending below the reach of frost. The chimney is of hard brick and mortar. The frame work, roofing, and exterior plastering, are similar to those described in last number. The gables are inclosed with vertical boarding, having their lower ends cut to pattern, and are battened over the joints. The ornamental verges in the gable cornices, are of pine boards, and, being of simple design, are readily made, and put in position while building. A pleasing effect is produced by "lining off" the surface of the exterior plastering into courses or squares. This is easily done with a "straight-edge," and an **S** shaped iron while finishing. The final "Stearate" covering (see last month) may be divided and shaded in two parts, and so applied as to give the alternate squares slight changes of shade. The best results may be obtained from exterior plastering where properly done. It is impervious to either air or water, and therefore equals the more expensive methods of inclosure for houses of this character. It should not be attempted over *horizontal* lines of framework, as the shrinking and consequent contraction will cause a bilging and cracking of the plaster at those points. Whenever obliged to cross such timbers, the upright frame work must be halved on to them, and continued in whole lengths, to prevent such contractions. All joinings with the exterior wood finish must be carefully made, especially at the top, to prevent water from entering, and running down behind the walls. Wide projectives of cornices afford a valuable protection for such walls against driving storms. Exterior plastering may be done in any season that is free from frost. An ordinary rain will do no injury to either of the two coats of plaster after they have become hard. The "Stearate," described last month, should be applied as soon as the plastering is thoroughly dried.

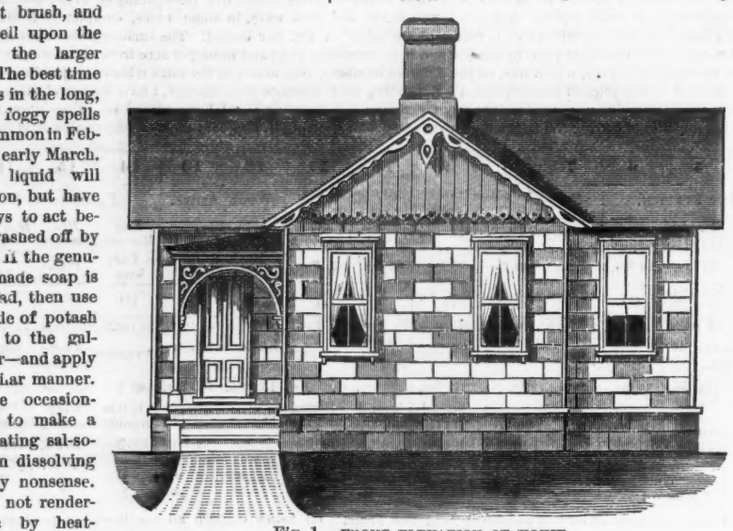


Fig. 1.—FRONT ELEVATION OF HOUSE.

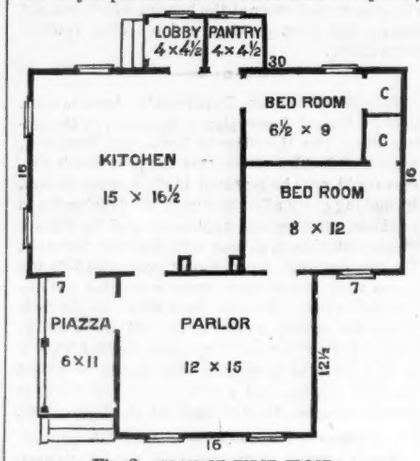


Fig. 2.—PLAN OF FIRST FLOOR.

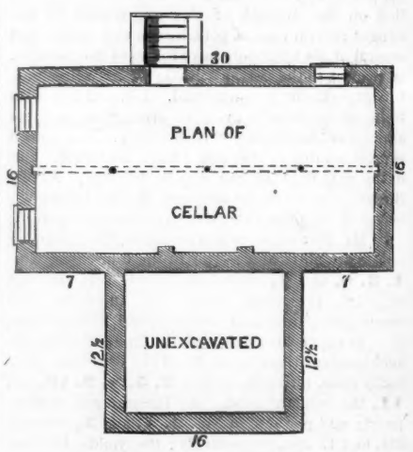


Fig. 3.—PLAN OF CELLAR.

Estimate for cost of materials and labor:

54 yards excavation, at 20 cents per yard		$ 10.80
1300 feet foundation, at 10½ cents per foot		136.50
1250 brick, laid, at $12 per 1,000		15 00
28 feet stone steps and sills at 28 cents per foot		7.84
120 yards exterior plastering, at 50 cents per yard		36.00
224 " interior " 25 "		56.00
1700 feet of timber, at $15 per M		25.50
2 sills, 3x8 in. 30 feet long.	9 posts, 4x6 inches 10 feet long.	
3 sills, 3x8 in. 16 feet long.	14 beams, 3x8 in. 16 feet long.	
2 sills, 3x8 in. 13 feet long.	7 beams, 3x8 in. 13 feet. long.	
2 plates, 4x6 in. 30 feet long.	10 beams, 2x8 in. 16 feet long.	
3 plates, 4x6 in. 16 feet long.	7 beams, 2x8 in. 13 feet long.	
2 plates, 4x6 in. 13 feet long.	1 piazza, 2x8 in. 18 feet long.	
200 wall strips, at 10c. each		20 00
Cornice materials and Gable finish		22.00
180 shingling lath, at 5c. each		18.25
16 spruce planks, at 20c. each		9.00
34 bunches shingles, at $1.25 per bunch		3.20
80 flooring planks, at 20c. $16; piazza, $40		42.50
3 cellar windows, $9; 8 plain windows, $56		56.00
11 doors, $44; closet finish, $12		65.00
Nails, $10; carting, $12		56.00
Painting, $30; carpenter's labor, $75		22.00
Incidentals		105.00
		15.41
Total Cost		$700.00
If cellar is omitted, deduct		167.14
Cost without cellar		$532.86

The Cheese Factory.

The tendency of modern improvements is to lighten labor and increase its effectiveness. By the introduction of various kinds of machinery, men engaged in agriculture are enabled to do in one day as much as could be done in a week without them. What the mower, reaper, and thrashing machine have done for farmers, the cheese factory has done for their wives and daughters. Years ago the work of the farmer's wife was never done. The first to go to work in the early morning, she was the last to rest, late in the evening, and after taking her share in the milking and the care of the milk, the churning and cheese-making, with all the slopping, and washing of pans, pails, cans, tubs, churns, and cheese-presses, were added as additional duty to the already sufficient cares of the household. The invention of the factory system changed all this, and relieved the women of the farm, not only from the care of the milk, but in a great measure from the milking as well. In the farmers' households there is now much more of comfort, leisure, and culture, than there was before all the labor-saving improvements were adopted, and where these are made the most of, there is more profit than formerly. There is more money passing through the dairy farmer's hands now than ever before, and the location of a cheese factory in a dairy district is to be considered as a decided benefit. The market for cheese is only opened as yet, and before it can be fully occupied, the number of cheese factories may be greatly multiplied. The home demand for this form of food has never been cultivated, the foreign market having received all the attention. There has been no desire to consult differing tastes, and but one kind of cheese, and good, bad, and indifferent of the kind, has been manufactured. An exacting purchaser of cheese might travel over a considerable portion of a large city, without finding any choice beyond an ill-flavored, leathery product which goes by this name, unless he found, by mere accident, some foreign cheese, or some of American make put up in the form of the foreign article, and intended to compete with it. It is a question whether the makers or the consumers are most to blame in this. But it is rarely that a good thing goes a begging for purchasers; on the contrary, a supply of it at once creates a remunerative demand, and which rapidly enlarges as the commodity becomes known. If we had a plenty of cheese of different qualities and shapes, calculated to please the palates and the eyes of purchasers, there is no doubt that our home market would soon increase so largely, that many new factories would be required to supply the demand, and that the prices obtained for the best product would be very profitable.

The process of making factory cheese differs in no respect from that of the old dairy methods, excepting that much labor-saving machinery is used, and that the milk of 600 or 1,000 cows is made into cheese, with very little more cost for labor and utensils, than the milk of 20 or 30 cows would require in the old-fashioned home dairy. The product, if not equal to the best of the farm dairy cheese, is at least of even quality, and is better than the average of that formerly made in dairies. By the use of steam power, and an economical distribution of labor, the cost of making cheese is reduced to the lowest limit, and the return to the farmer for the milk, is greater than he could realize in any other way. An average of 2 cents per quart, or a gross sum of $40 to $50 for the season is the satisfactory and profitable income from each cow, when well managed; and this is paid in cash as the cheese may be marketed, without the loss of time that would be necessary in seeking a market. As the cheese factory is open but a portion of the season, this income therefore represents not much more than three-fourths of the product from each cow, and during the remainder of the time she adds to the amount of this income. As a rule, each dairy cow may be made, by the help of the factory, to yield the income stated in cash, besides furnishing some butter for family use or sale during the winter, when the factories are closed, if proper arrangements are made for this. With all their manifest advantages, it is strange that there are not more factories in districts where cows could easily be kept, as well as that dairymen should be contented with cows of so poor an average quality as are common. The experience of the past year, however, during which market gardening has been a losing business, has turned the attention of many farmers to the keeping of cows and the production of milk, and it is reasonable to expect that several factories will be erected in the neighborhood of the large cities where various articles of food, richly productive of milk, can be cheaply procured.

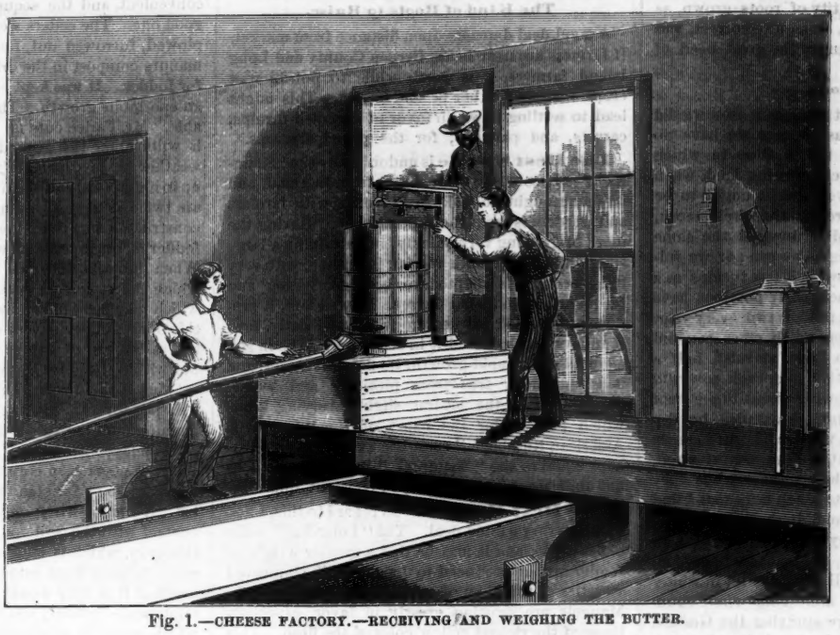


Fig. 1.—CHEESE FACTORY.—RECEIVING AND WEIGHING THE BUTTER.

The cheese factory routine is very simple, and is reduced to a very thorough system in which everything is conducted by strict rule. The milk brought to the factory by the patrons is weighed in a large receiving can, (see fig. 1), and is then run through a strainer and a tin spout into the vats, where it is brought by steam heat to the proper temperature for adding the rennet. The different processes through which the milk passes before it finally appears in the finished shape in the curing room, are referred to elsewhere. The last stage is by no means an unimportant one. The curing process needs to be managed with the greatest care. The curing house in which the cheese are kept to ripen, and await a purchaser, (shown in figure 2), is constructed so as to maintain an even temperature. The walls are double, and the space between them is filled with sawdust, or other non-conducting material. Steam pipes for heating the room in cool weather are fitted around the walls in many factories, and ample ventilation is provided for. The windows of the curing room are shaded with blinds, or what is preferable, should be made only upon the north side of the building. This room is generally situated above the "make-room," but in some factories a separate building is provided, where the stock of cheese can be kept free from all the effects of dampness, changes of temperature, or the partly vitiated atmosphere from below; as the quality and value of the cheese depend upon the perfectness of the curing.

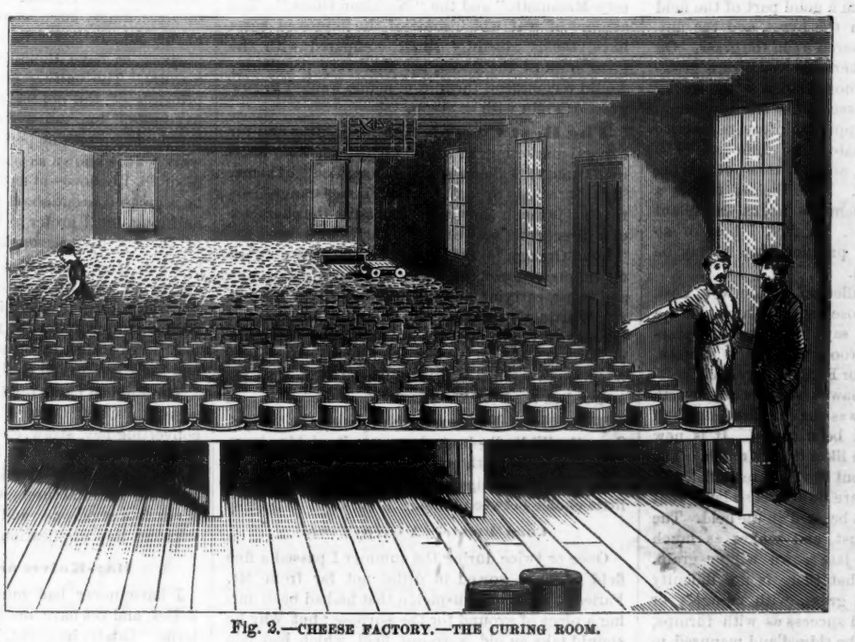


Fig. 2.—CHEESE FACTORY.—THE CURING ROOM.

Among the Farmers.—No. 25.

BY ONE OF THEM.

I have heard from several sources the intimation that the hint that improvement in farm practice was indicated by the quantity of roots grown, as suggested in a recent letter, was quite correct, and that in every part of the country the great need of agriculture is

More Roots.

I have sometimes thought that the reason we did not cultivate more roots was because we have no regular place for them in the rotation to which time-honored custom subjects mowing land, when the grass grows thin, and we think it ought to be "taken up." We swing around the circle—corn, potatoes, oats, (or rye), seeding down at the same time; and then mow as long as we can; or we follow some other rotation, sowing a few turnips as a "catch crop," perhaps, where early potatoes have come off; and so getting a ton or two every year. This is not enough. When milch cows can not have grass, they ought to have, at least, half a bushel of roots a day. At that rate, each cow will eat half a ton a month, allowing about 10 per cent for loss. That quantity is none too much for dry stock which are being well wintered. Our farmers are well aware that the better cows are wintered, the surer and better are their returns when they come in. Yet roots make so much milk that I find where milk can not be sold, it makes so much work in winter with usually poor returns, that an abundance is objectionable, and so there is little inducement to grow roots. However, milk in winter is becoming desirable over almost the whole country. Intelligent farmers are studying the Guenon system which, if it have a real value, indicates which cows will hold out well with their milk, and which will not; and does this while they are mere calves.

Seeding Down to Grass With Roots.

I did not intend to convey the idea in the December number that seeding land down with turnips was a new discovery, for I have seen it practised and written about it before, but have never done it. I remember seeing on the Island of Jersey, a beautiful stand of grass and clover, so thick and strong in October that it looked like a spring seeding, and yet it had been sowed with turnips in July. The roots had been pulled from a good part of the field for feeding to the cows in the byres, and the animals were then being tethered upon the grass. On those parts of the field where the roots were growing in spots, they were almost hidden by the strong rye grass. Yet the yield seemed to me very large. It is sometimes risky to apply such foreign practice in this country, our climate is so different. The summers are hot and dry, and our times of sowing and harvesting differ also. Nevertheless, this is a case in which it would seem we might transplant the custom with success. In fact, I hear of so many cases of successful practice, that it may be confidently recommended.

A letter from Judge Fullerton, of the New York Bar and Bench, but whose large farm is in the vicinity of Washington, says that he has practised seeding down with roots with entire success.

I went over my neighbor Farlee's farm, at Cresskill, the other day, and saw several things worth making a note of. One was the excellent stand of grass where Swedes had been raised. It is new practice with him, but he likes it very much. The roots are sown in drills, but the culture is flat, and the land, after the roots are pulled, is so level that a mowing machine might be used on the field. The grass was sown in August, and makes as much show on the ground as late sown winter grain.

Mr. Crozier tells me that there is no difficulty about sowing grain, or grass, with mangels or sugar-beets, with as good success as with turnips, even though the ground be ridged and manured in the ridges. The culture tends so to flatten the ridges, that by the first of August, which is as early as grass or grain ought to be sowed, or it may be a little earlier, in case the growth of the roots is such that the crop must be "laid by," it is for all useful ends level. The seed will start well under the shade of the leaves, and, as a rule, these begin to wither at the base, sufficiently to give light and air to the young grass plants, while they are sheltered from too great heat. Sometimes the shade is too much for the good of the grain or grass, but as the season advances it catches up.

The Kind of Roots to Raise.

A good deal depends upon distance from market. If farmers are near as are Bergen County and Long Island farmers, it is worth while to put in root crops that may either be sold or fed. This might lead to settling down in favor of Swedish turnips, carrots, and parsnips, for the principal crops.

The Best Swede is undoubtedly the "Shamrock." It comes to this country from England, and its name ought to make it a favorite with farmers and gardeners from the Emerald Isle. Having the merit of growing very quickly, and attaining a large size, while it is smooth and fair in outline, with very little neck, it is adapted to both marketing and feeding, to an unusual degree. Sowed late, it produces the fairest market crops; sowed early, few, if any, varieties exceed it in size, and if it be in soil adapted to its rapid growth, its flavor is sweet, and it is unusually free from pithiness and woody fibres. Among the several slightly-varying kinds which pass under the name of the "Improved American Rutabaga," some are excellent, and perhaps equal to the "Shamrock," but the name does not indicate, by any means, so constant qualities.

The Best Mangel.—In regard to this, I find opinions vary a good deal. The "Long-Red" is the old favorite, and it may be that a greater weight of fodder may be produced to the acre of the improved varieties of this than of other kinds, but the Globe Mangels are growing greatly in favor, especially those of the richest yellow color of the flesh. This color being more or less imparted to the milk and butter, it becomes an object to cultivate those which possess it. The old "Yellow Globe" has been improved by several parties, and of the yellow kinds which are new, and have been well tested, "Warden's Orange Globe," and the "New Kinver," are decidedly the favorites. The latter is one which some of our best growers extol highly, equally for yield, for smoothness, and for color. The varieties claiming special favor originating from the Long-Red, and much like it, only growing larger, and smoother, and with less neck, are "Carter's Mammoth," and the "Norbiton Giant." The amount of leaf which some of the improved sorts have, seems absurdly small compared with the great bulk of the roots, yet this very peculiarity would recommend them in case one wanted to sow grass or grain with the crop.

The Best Carrot, both for feeding and for general marketing, is, without question, the "Half-long Orange," called also "Half-long Red" by some. This is precisely the color of the "Long Orange" carrot, but is much shorter, having quite the character of a direct cross between the "Early Horn" and the "Long Orange." This medium-sized carrot is an enormous cropper, of a smooth, beautiful shape and color, carrying its thickness well to the tip, and a very attractive market sort as well as an excellent table variety. In fact, it seems to leave little improvement possible, or at least probable. It should be borne in mind that imported seed is not nearly so good as the best American.

The Best Parsnip is probably the "Long, Smooth White,"—best, because it yields large crops, and is smooth and long. The several varieties of long parsnips are much alike, and there is little choice between them.

Corn Fodder—A Great Crop.

Once or twice during the summer I passed a fine field of corn, sowed in drills, not far from Mr. Farlee's, and had a suspicion that he had been hiring a piece of ground for the purpose; but why he should take an old worn-out field, which had lain idle long enough to have cedar trees four inches in diameter at the root, growing upon a good part of it, I did not see. As I was saying, I went over his farm a few days ago. My errand was to see his fine herd of Jerseys, and well worth the visit as they were, that field of corn made quite as strong an impression. The land, it seems, has been held for speculative purposes, and is owned by a relative, so Mr. Farlee obtained the use of it rent free if he would grub out the cedars, and put it in good cultivation. This, most people would think, was paying dearly for the use of the land; but it lay convenient, and the sequel shows his plan was a good one. The cedars were grubbed out, the land plowed, furrowed out, liberally dressed with hen-manure compost in the drills, and sowed with corn for fodder. It was kept clean, and the corn made an enormous growth. The season was very favorable. Mr. Farlee cuts up his corn fodder, and after it wilts upon the ground for a day or two, if the weather be favorable, otherwise at once, it is set up in big stooks, and securely bound. These stooks are twice as large as ordinary corn-stooks—they are constructed around a stooking-horse, and the corn fodder is left in them all winter, or until consumed. When brought into the barn, those are selected which show signs of weakness—of course, first any which may have blown over, though if well set up this does not occur very often. The outer leaves and stalks are of course considerably weathered, but within the color is green and fresh, and cattle eat almost the whole. The value of this single crop will pay for the clearing, and all the labor and manure required to produce it, and leave a handsome balance over.

I have never seen corn fodder better secured, nor in better shape for standing well through the winter. A small portion only of it will be damaged by contact with the soil, and the labor of harvesting this crop, which is such a bug-bear as to prevent many farmers from undertaking to raise it, or as much of it as they would like, is thus reduced to a minimum—certainly less than securing the hay crop which would be produced on the same land.

Writing about raising fodder corn reminds me of the importance of

Cutting Corn Fodder

when it is fed out. My cows are getting little else now in the way of dry fodder. It is cut by hand, in inch bits, moistened with scalding water, sprinkled with rye bran and a little corn and oat meal, covered up with a rubber cloth, and left to soak and swell from morning to evening, and evening to morning. The result is, it is eaten up very clean, a double handful of buts a day being all that the most fastidious cow rejects. In cutting up a bundle of exceedingly large, coarse stalks, the cuts just at the but are made four or five inches long, on purpose to have them in shape to go into the manure. The cutting box which I use, is on the principle of the old-fashioned "cutting box and hay-knife," but much stronger, heavier, wider in the throat, or narrow part of the box, and easier to work. It is known as Clark's hay-cutter, and costs $7 or $8, I believe—at any rate, mine did. It may be regulated to cut about one inch to an inch and a half long, but I prefer to leave it so that the length of the cut may be optional with the cutter.

When large quantities of stalks, straw, or hay, are to be cut, of course no such "one-horse" apparatus as mine is admissible. A power cutter is needed, and is by far the most economical. These may be operated by horse, bull, or steam power, and there are several really first-class machines.

The English name for implements for this purpose is "Chaff Cutters." That is, machines for converting hay, straw, etc., into *chaff*, and certainly finely-cut hay, or even corn stalks, is very like what we call chaff—that is, oat or wheat chaff. I wish our manufacturers would adopt this name—it is surely a good one; and we have *cutters* enough without this application of the word.

Hay-Knives or Stack-Cutters.

I have never had much experience with hay-knifes, and yet have used several of different patterns. Lately, however, I have been using one of the "Weymouth Patent Knives," and an admirable one it is. It is made sword-shaped, with a zig-zag edge, the front edge of the zig-zag only being sharpened. It is certainly not more than half the labor to cut through the hay with this knife, that it is with the ordinary ones. The benefit of cutting

from the side of a mow, or stack, is so great that I wonder at myself that I have ever been contented to pitch off hay from the top of the mow, unless indeed I wanted to use some particular kind of hay, the location of which was accessible there. The obvious advantage of the use of the knife is that hay gotten in early, with the sweet fragrance of vernal grass, and clover, may thus be mingled with that of later growth, wiry, perhaps, and lacking in flavor, though not in nutrition, and sometimes even in that, and this with the succulent aftermath perhaps, all together being highly relishable. Its use admits of sorting horse from cow hay, or throwing out any that may have heated.

Talks on Farm Crops.—No. 12.

By the Author of "Walks and Talks on the Farm," "Harris on the Pig," etc.

"I have lately read several articles in the papers," said Charley, "recommending rye as a green manure for potatoes."

"This crop," said I, "has certainly several things to recommend it for this purpose. It grows late in autumn, and early in spring, and thrives best on land most likely to be benefitted by plowing under a quantity of green vegetable matter."

"For our own use," said the Deacon, "we select potatoes grown on light, dry, sandy soil. They are cleaner and smoother than if grown on heavier soils, and are supposed to be of better quality than on low, rich, alluvial, or mucky land."

"On my farm," said I, "the old men, who worked on it before it was underdrained, frequently remarked: 'The east side of this field, or the north end of that one, or the west side of such a lot, is good for potatoes'—and in every case they select dry, sandy, rolling land. I have no doubt as to their general correctness. Still, since underdraining, we often get far larger crops on the rich, dark soil in the valleys. Last year we had a great crop of 'Early Vermont' potatoes on the lower portion of a field where, before draining, nothing would grow except coarse grass and rushes. The soil is a black, mucky sand. On this the crop was not only unusually luxuriant, and the yield large, but the potatoes were of remarkable excellence."

Facts of this kind lead us to suppose that potatoes like a loose soil, rich in decomposed carbonaceous matter. And, this being granted, it seems not unreasonable to conclude that it is a good thing to plow under some green crop, which will furnish a considerable quantity of carbonaceous matter. Rye is recommended for this purpose.

"And in addition to the carbonaceous matter," said Charley, "it is claimed that when we plow under a crop of rye in the spring, we turn under a large quantity of water which keeps the ground moist, and enables the crop to withstand drouth."

"These arguments," said I, "are very plausible, but will scarcely bear a critical examination. In the first place, a crop of rye which, if cut and cured, would afford two tons of hay or straw, would not, in its greenest and most succulent condition, contain over 11 tons of water. The crop plowed under adds to the soil less than would be furnished by *one-tenth of an inch* of rain. Furthermore, the growing crop of rye would suck up out of the soil, and evaporate into the atmosphere, far more water, during a few days previous to its being plowed under, than the crop contains. Lawes & Gilbert determined, by actual experiment, that on June 27th and 28th, 1870, an acre of fallow land, 4½ ft. deep, contained 2,875 tons of water, while an acre adjoining, in barley, contained, to the same depth, only 1,951 tons of water. In other words, the roots of the barley had sucked up out of the soil, 924 gross tons of water per acre, equal to 1,034 of our tons. To grow a crop of rye, and turn it under *for its water*, is absurd. It would be much more reasonable to suppose that the good effect of the rye was due to its evaporating such a large quantity of water from the soil, and so making it drier."

"There may be something in that," said the Doctor. "We are too much inclined to look on all our agricultural practices in reference to their action on the supply of plant-food. There are other things equally important, and draining is one of them. We drain to get rid of the water that the soil will not hold. If it holds 25 per cent of water, and it contains 30 per cent, then we drain to remove this 5 tons of water out of every 100 tons of soil.

"Mr. Lawes found that the plot of land in his experimental wheat field, which has received no manure for many years, contained to the depth of 9 inches less than 23½ per cent of water, while the plot adjoining, which had received 14 tons of barn yard manure every year for 23 years, contained nearly 34½ per cent of water. In other words, the 9 inches of surface soil of the 'no manure plot,' contained 352 tons of water per acre, while the plot adjoining, only a few feet distant, which had been heavily manured for many years, contained 517 tons of water per acre. The land is thoroughly underdrained, and one plot, so far as surplus water is concerned, was probably just as wet and just as dry as the other. The examination was made in January, and we may presume that the no manure plot, at any rate, was saturated with water. It contained all the water it would hold."

"This is an interesting fact," said the Deacon, "and explains why our soils, when new and full of organic matter, did not need draining so much as they do after being cultivated and cropped for 30 or 40 years without manure. It explains, also, why we suffer more from drouths than formerly. There is far less moisture in the soil than there was when the country was new, and when the soil was full of what you call 'natural manure.' But I do not see what all this has to do with plowing under a crop of rye for potatoes."

"Simply this:" said I, "It is difficult to explain *why* the rye should do so much good as is claimed. It seems absurd to attribute this to the water in the rye. And it has not been proved that the carbonaceous matter, which the rye gets from the atmosphere, is specially needed by the potato crop."

Here is an experiment made in 1871, on a sharp, gravelly, overcropped soil, in poor condition:

Plot 1—without manure, produced	70	bu. per acre.
" 2—with superphosphate and ammonia	186	" "
" 3—with superphosphate, ammonia, and potash	204	" "
" 4—with 20 tons farm yard manure	197	" "

Plot 3—with ammonia, phosphates, and potash, and *no carbonaceous matter*, produced more potatoes than Plot 4, with farm yard manure, which, in addition to the ammonia, phosphates, and potash, contained a large amount of carbonaceous matter. And we should expect a "sharp, gravelly soil," to be unusually poor in carbonaceous matter.

Now it may be taken for granted that the rye does not get anything from the atmosphere except carbonic acid. The nitrogen and mineral matter it gets from the soil. If you grow and plow under a crop of rye, you *add nothing* to the soil except carbonaceous matter. And, so far as I can see, the good effect of the rye must be due to some of the following causes:—1. The roots of the rye find a quantity of soluble plant-food in the soil. They gather it up, and when the rye is plowed under, this plant-food is left in a more compact or concentrated form. The roots of the potatoes can perhaps use it to better advantage than if it was distributed through the soil.—2. The rye, by evaporating water, may make the subsoil drier during the winter and spring months, and to that extent have the same beneficial effect as underdraining.—3. The rye may get considerable carbonaceous matter from the rain and atmosphere, and this, when the crop is plowed under, decomposes, and renders the soil more retentive of moisture.—4. The rye may keep the soil loose and render its mechanical condition more favorable for the potatoes.

It cannot be doubted, from the facts which have been published, that plowing under a crop of rye sometimes proves of great benefit to the following crop of potatoes. But I have an idea that much will depend on the character of the soil and on the season. The practice may in some seasons be a good one on some soils and not on others. If I had a crop of rye sown for plowing under as a green manure for potatoes, I would plow it under; but if I had not, I should not despair of being able to raise just as good a crop by other means.

If the growth of the rye makes the land drier, the same effect can be obtained by underdraining—or we can plant on land that does not need draining. If the rye makes the land loose and mellow, good tillage will do the same thing. If the rye concentrates the nitrogenous and mineral plant-food, we can apply this same plant-food in artificial manures. If, in addition to this, it furnishes carbonaceous matter, farm-yard manure will do the same thing. But after we have done all that we can do, we shall still be very much dependent on the season. And it will be a good plan to plant our potatoes at different times.

Three years ago (1875) we had a remarkably favorable season for potatoes. When the land was in fair condition, we had a good crop, whether we planted early or late, in hills or in drills.

In 1876 we had a fair crop on very rich, well drained, warm, loose, sandy loam, when we planted early varieties, early, kept the soil clean and fought the bugs. But late varieties, planted early or late, or early varieties planted late, were, on my farm at least, and also on the Deacon's, a failure.

Last year (1877) late planting of early or medium varieties gave fully as good a crop as early planting. In 1876 we had a moist, growing spring, followed by a great drouth in July and August. And the drouth and the bugs left the late planted potatoes no chance to grow. The early varieties, when planted early, had got a good growth before the drouth seriously injured them.

Last year we had a severe drouth early in the season, and abundant rains in July, August, and September. Hence the late planted potatoes, where the soil was favorable, grew rapidly, and produced a fair crop. I had several acres of "Late Rose" potatoes, planted on June 16th and 17th, that made a vigorous growth, and gave a good crop. The land was a clover sod in fair condition, turned over immediately before planting, and no manure used.

If the season is favorable, and the land is clean and mellow, a late planted crop of potatoes will have a ranker and more luxuriant growth, than a crop planted earlier in the season. My early planted potatoes, last year, were liberally manured, but the vines were never as dark colored and vigorous as those planted late without manure.

Where "Early Rose" or "Early Vermont" potatoes are grown for an early crop, it is necessary to plant early and manure liberally. We have to "force" them—not by artificial heat, but by extra manuring. An unnaturally early crop is a costly crop, and is only profitable where we can get an extra price. Where "Early Rose" potatoes are raised, as they are to a considerable extent in this section, for sale as a common farm crop in the fall, it is very doubtful whether we can afford to plant them very early. They require much richer land, or more manure, than they do when planted later.

"That is all true, theroretically," said the Doctor, "but as a matter of actual practice, I suppose our friend, the Deacon, will tell us that it depends a good deal on the season; your suggestion to plant part of the crop early, with liberal manuring, and part late, with less manure, is safe and sound."

"Well," said the Deacon, "I had about concluded that we should have to plant early kinds of potatoes, and plant them early, so that they would get out of harm's way, or the bug's way, before harvest, but I am not sure that late planting of early potatoes will not sometimes give better results. It will depend on the season. The main crop of potatoes will be raised, not from an early variety, nor yet from a late variety, but from a half early or medium variety like the 'Late Rose,' and it will be planted just before or just after corn planting."

I presume the Deacon is right. But if I had very rich land in prime condition, and wanted a big crop of autumn or winter potatoes, I would plant the "Late Rose" as early as the condition of the land and other spring work would admit—say as soon as we had sown our barley and oats.

"But suppose," said the Deacon, "you had poor land?"—"Even in that case," said I, "early planting gives us the best chance. I would plant early, in hills 3 feet apart, and use large sets with only a few eyes in a set, and only one set in a hill."

"I have known just as good crops," said the Doctor, "raised from small seed as from large."

"On that point," said I, "much depends on circumstances. If I got seed from a distance; if the land was rich, warm, and mellow, and everything favorable, and if we planted early, I would prefer small or medium sized potatoes, rather than large—not that I should expect a larger crop, but because the small seed would plant twice as much land, and thus reduce the cost of seed one-half. But if the land was in poor condition, and we were obliged to plant late, I should prefer the larger seed."

Making Wheels by Machinery.

The lightness, elegance, and surprising strength of American carriage wheels are well known, not only everywhere in this country, but are considered remarkable in Europe. American carriages are becoming fashionable in England, now that their lightness has been found consistent with actually greater strength than is possessed by the heavy, lumbering English vehicles. Our carriages, wagons, and wheeled vehicles generally, owe much of their beauty and usefulness to the excellent structure of the wheels, and this is principally due to the excellence of the machinery by which all the parts of the wheels are made and fitted together. Formerly it was a long and tedious labor to make a wheel, and when it was made, the joints were ill-fitted and soon worked loose. When a wheel gives out, the carriage is useless, and it is therefore of the greatest importance that the wheels of all our vehicles, subjected to very hard usage upon our generally miserable roads, should be made in the best manner and fitted with exactness. It is only by the use of machinery that joints can be made to fit perfectly close, and that every mortise and tenon of this kind in a wheel should be precisely alike. Since machinery has come into general use, and there have been such extensive wagon and carriage manufactories as those of the Milburn and the South Bend works in operation, farm and road wagons and carriages of all sorts have been greatly cheapened and improved. The work about a wagon or carriage requiring the greatest skill, is in the wheels. If the joints are not well made, the

Fig. 1.—HUB-BORING AUGER.

Fig. 2.—CLAMP FOR HOLDING HUB.

wheels soon begin to work, and open, water penetrates, the wood swells and shrinks alternately, and they very soon become an utter wreck. No more severe test of the perfection of a wheel can be exacted than that of the arid plains of the West;

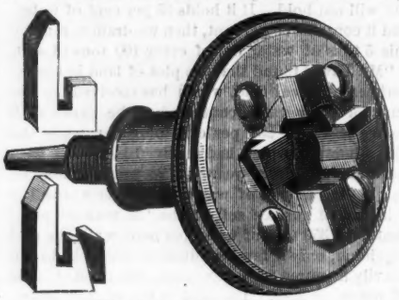


Fig. 3.—HOLLOW AUGER.

and machine made wheels have stood this test without failure. The machinery used in making wheels is very varied. The hubs are turned in lathes and mortised by mortising machines; the felloes are sawed by band-saws, which cut several pieces at one operation, and the spokes are turned in a lathe and tenoned by a tenoning machine. All this is simple work, however, and could be done very well by an expert mechanic by hand. But to bore out the hub perfectly true, with a tapering hole if required, and at right angles with the plane of the wheel, is hardly possible to be done by hand in every case, even by the most skillful workman. This, however, is done by the auger shown at figure 1, which is held at right angles to the rim of the

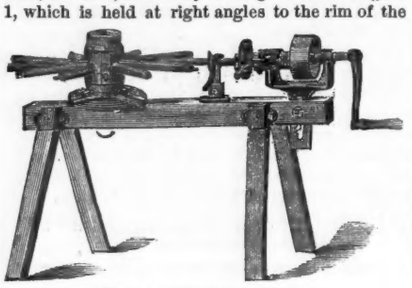


Fig. 4.—MAKING TENONS.

wheel by the clamps shown at figure 2. This ensures the proper boring of the hub and the true running of the wheel upon the axle. The tenons of the spokes are cut with the hollow auger shown at figure 3. This is mounted upon a frame, upon which the hub is also mounted, as shown at figure 4, and thus every tenon is made to bear an exact and proper relation to the hub and the axle and with each other. The felloes are bored in the manner shown at figure 5, and each hole being of precisely the same size and in the same direction, is made to fit any one of the tenons of the spokes. This ensures the easy but perfectly accurate fitting of these parts, and the consequent strength and durability of the wheel, although it may be of such exceeding lightness as is seen in one of the road wagons to which the fastest roadsters are hitched. The machinery here illustrated is made by the Silver & Deming Manufacturing Co., Salem, Ohio.

Comparative Value of Pedigree and Non-Recorded Jerseys.

BY THOMAS FITCH, NEW LONDON, CONN.

The Boston "Evening Traveler," of Oct. 19th, gave a full report of the sale of the herd of the late Alvin Adams, of Watertown, Mass., with the pedigree, name, and number of registry in the American Jersey Cattle Club Register, of 38 cows recorded in the book, with the names of the purchaser and residence; and also of 5 cows without pedigrees, with names of cows and purchaser, and the price each cow sold for, I find by this report that the five cows without pedigrees, or record, sold for a higher average price by about $10 each, than those registered with authentic pedigrees. This report says, also, there were present about 800 of the Jersey stockraisers of the United States, etc., and that this herd was considered the finest in the country.

Admitting these facts, how happens it that the five cows, without record or pedigree, sold for a higher price than the Herd Register cows, except for the real reason, that they were the best cows, as they were, in all that makes value in a Jersey cow, viz., in form, size, udders, teats, colors, beauty, and all the qualities making value. I have conversed with several breeders, members of this Club, that were present at this sale, and they, without exception, all admit this.

The American Jersey Cattle Club, when it formed their Register, claimed that its object was to prevent imposition upon purchasers of Jerseys, by separating the pure from the mixed stock, or grades, that were sold for thoroughbreds. It was to be a purely philanthropic institution to prevent fraud. After years of labor, and sacrifice, and the collecting of thousands of dollars from the public, in the shape of entry fees to non-members of this Club, of

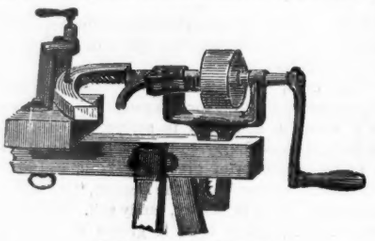


Fig. 5.—BORING RIMS.

$3 on each animal registered, and the boast in one of the Club's reports, that an additional value of more than 50 p. c. had been given to every Jersey entered in this Register, in almost the suburbs of Boston, on the very spot where the Club originated, with this great company of experts, breeders, and judges, the cows without pedigrees, or record, outsell those with pedigrees and record in this book.

[The writer of the above has perhaps singled out an exceptional case whereon to found a general rule. Any person who expects that pedigree alone will confer excellence, will probably be disappointed; but we imagine that Mr. Fitch himself places some reliance on the pedigree or descent of his own stock, even of those not recorded in the A. J. C. C. Herd Register.—ED.]

Rustic Poultry Houses.

The most profitable poultry in the world are those of the Irish and French people. More eggs are exported from France and Ireland than from any other countries. The fowls of those countries are in greater part lodged in the most primitive sort of shelters, there being few, or none, of the costly buildings which in this country are generally supposed to be needed for profitable poultry keeping. The usual French fowl house is a little cabin of boards or bark, with a thatched roof, and a yard fenced in with small poles or brush. Generally

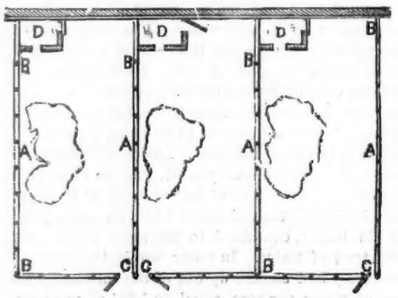


Fig. 1.—PLAN OF CHICKEN YARD.

there is a fruit tree of some kind, or more than one, in the yard. The Irish fowls are kept either in shelters made wholly of sods, built against the back part of the house, and warmed by the heat of the chimney, or the birds are accommodated with roosting places, along with the cow, in a part of the house itself. The hens are kept dry and warm, and this is the secret of their prolificness in eggs.

An illustration is here given (figure 2) of a very cheap poultry yard, similar to those we have often seen about the French farms. It is in three parts, and any number of compartments may be added.

In each division there is a small, cheaply constructed house for roosting and laying. This is made low in the roof, for the purpose of warmth, and may hold a dozen fowls. For this number, a house four or five feet square, with roosts around three sides, will be large enough. If the floor should be sunk two feet below the surface, it would be warmer than if level with the ground. A few

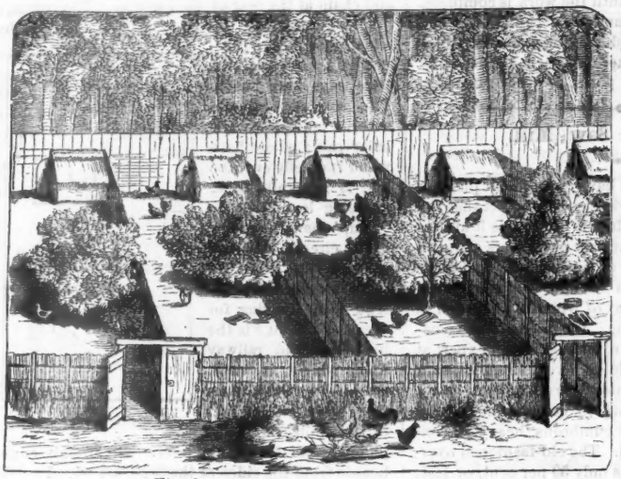


Fig 2.—ELEVATION OF CHICKEN YARD.

nest boxes may be hung upon the wall, so that the eggs can be removed through the window as well as the door. In the summer the window would be removed. A few nesting places may be made amongst the bushes, or trees planted in each yard. The ground plan is shown at fig. 1, on p. 56. Each yard may be 12 feet wide by 25 or 30 feet feet long. It will be found much better to keep the fowls in small families of a few hens with one cock, than to have them all together in one yard; the cocks may then be changed each year. The doors to the yards are made in pairs, thus saving cost in making the frames. When desired, one lot of fowls may be given a run outside by leaving a gate open.

Hints and Helps for Farmers.

A FEED TROUGH FOR PIGS.—This (fig. 1) opens by a falling door in the front of the pen, and has an inner dividing board and partitions in the front, by which the pigs are prevented from fouling the meal, or fighting each other away. In this trough the meal can be kept before the pigs all the time, so that they can eat when they wish. There is a watering trough used with this pen, so arranged that one end is within, and the other outside of the pen. One pig, only, can drink at a time, and the water is not fouled. With meal and water, ready at all times, 2¼ pounds of flesh has been put upon a pig in a single day.

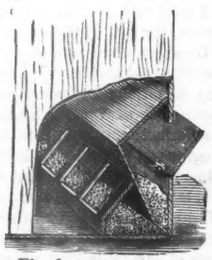


Fig. 1.—FEED TROUGH FOR PIGS.

FEED TROUGHS FOR POULTRY.—"W. L.," Pontiac, Michigan, sends a drawing of a feed trough, (fig. 2), which he uses for his chickens. It is made of narrow boards with square ends, and to prevent the fowls from getting into the trough, and wasting the feed, he fastens a small post at each end, and runs two cords, or wires, from one to the other, as seen in the engraving. This device is not so effective as that of the iron feed trough made by J. S. Spencer's Sons, of Guilford, Ct. This, shown at figure 3, is of cast iron; it is provided with three flanges on the edges, two of which are double, and are tightened with screws. The wire cover, shown in the engraving, is fastened to these flanges, and prevents the fowls from wasting the feed. A large size may be used for feeding pigs. The troughs being of iron, and painted, are very cleanly and indestructible. We have used several of these feed troughs in our yards, and find the saving of feed will pay for them in one season.

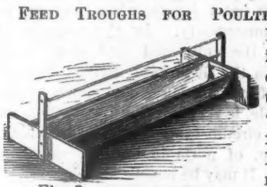


Fig. 2.—FEED TROUGH.

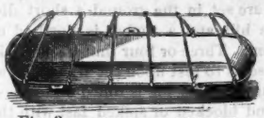


Fig. 3.—IRON FEED TROUGH.

A USEFUL FARM GATE.—J. B. Berry, Casper Co., Mo., sends a plan for a farm gate, which he has had in use for 10 years, and which he made as follows: The posts (*A*, *A*, figure 4,) are of white oak sticks 11 feet long, and large enough to square 12 inches; these are squared for 7 feet, leaving 4 feet rough and round; the bark being taken off, the rough ends are set in the ground 10 feet apart, and 4 feet deep. The post holes are filled with dry earth, well tamped all the way up. In loose soil, it is wise to set a sill between the posts near the surface of the ground, to prevent sagging, but in compact soil this is not necessary. The 6 bars are 10½ feet long and 6 inches

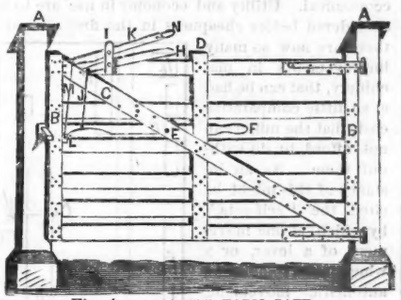


Fig. 4.—PLAN FOR FARM GATE.

wide; the uprights at the ends (*B*, *B*,) are 6 feet long. These are arranged and bolted together at every lap, as shown in the engraving. A brace (*C*,) 11 feet long, is bolted on to the bars upon each side wherever they cross. The upright slat, *D*, is then

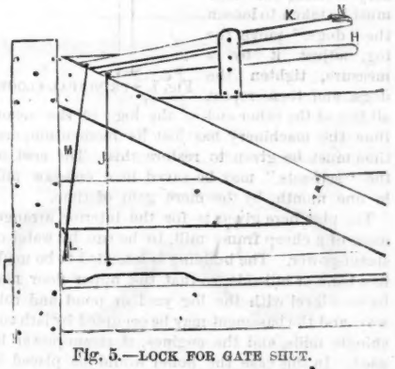


Fig. 5.—LOCK FOR GATE SHUT.

bolted on. The latch is 7 feet long, 4 inches wide, and thin enough to work easily between the braces where it is pivoted at *E*. It is raised by pressing on the handle, *F*. The hinges are then bolted on to the side *from* the post, so that the gate will open completely back. They are seated upon pieces of wood fitted to the upper and lower bars to make them level with the upright bar. To prevent the latch being lifted by animals, a lock, *L*, is fixed to the gate. This is connected by a wire, *M*, to the lever, *K*. Another lever, *H*, is pivoted at *I*, and connected with the latch by a wire, *J*. When the

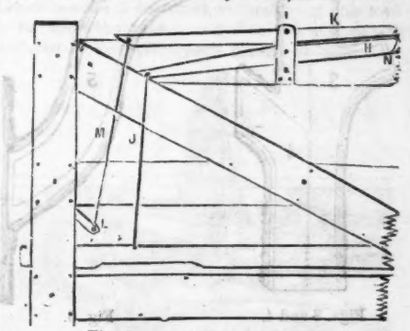


Fig. 6.—LOCK WHEN OPENING.

lock is out of use, the loop, *N*, is slipped over the lever, *H*; the latch will then work as if there was no lock. For the catch, a piece of 2 x 3 stuff is cut, as shown at *A*, *B*, *C*, fig. 7; the slope, *B*, being 4½

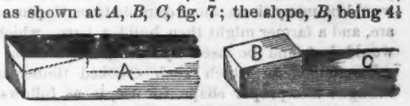


Fig. 7.—FORM OF CATCH.

inches long, the catch 1 inch deep, and the stem, *C*, 2 inches square. The lock, when closed, is shown at figure 5, and when open at figure 6.

A BRACE FOR A SLED TONGUE.—"J. K.," Sullivan County, New York, gives a description of a brace for the tongue of a sled, shown at figure 8. This is made of two short chains, one at each side of a ring, which slips over the tongue, and rests against an iron bolt. The chains are hooked to the rings which are fastened on to the ends of the roller, as shown in the engraving.

Fig. 8.—SLED BRACE.

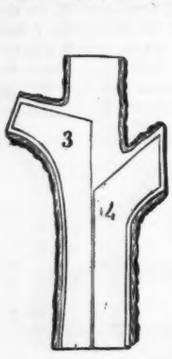
The Value of Crooked Timber.

When timber was plentiful many years ago, it was used without any thought of economy, or of the time when it would be worth saving. Then it was customary to use the finest pine, cherry, and walnut for fence-rails, and to split into slabs for making and flooring stables and pig pens; the best of the timber was used for this purpose, because it was most easily split, and made the smoothest and broadest slabs. Now timber is scarce and valuable, but we have not yet learned to use what is left to the best advantage. We use the straight timber for sawing, and burn everything that is crooked. For some purposes crooked timber is most valuable. Where it will pay to freight timber to places where ships are built, crooked timber is more valuable than any other. For ships' ribs, knees, etc., various kinds of bent timber are in great demand. But there are various uses for crooked timber on the farm, or for house-building.

Figs. 1 and 2.

A brace of bent timber of such shapes as are shown at figures 1, 2, and 5, would answer every purpose in a building that a straight one would do, and for supporting beams the forms shown at figures 3 and 4 would, altered slightly to make them right-angled,

serve as substitutes for braces, or if of light timber, would answer to fasten to rafters as feet to sustain the thrust of the roof against the plates. We have become accustomed to building with very light timber, and our houses and barns are worn



Figs. 3 and 4.

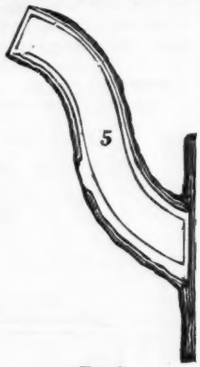


Fig. 5.

out and wrecked, before the generation which built them has passed away. By making use of heavier timbers, and working into them such crooked pieces for the purposes mentioned, our buildings would be many times more durable than they now are, and a farmer might then build a barn, which would last and be used by his grandchildren.

The mode in which such crooked timber is brought into proper shape for use, is as follows.

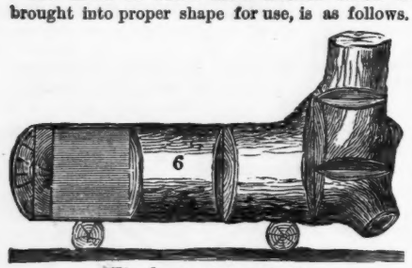


Fig. 6.—HEWING A KNEE.

The rough pieces, which are generally the roots, limbs, and crotches of trees, are laid upon some cross-piece and blocked up firmly, or are held so by "dogs," which grip the logs. The dogs are bars of iron half an inch thick, bent and pointed at the ends as shown at figure 7, and in use at *a*, figure 8.

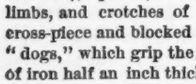


Fig. 7.—DOG.

The timber is lined on the top with a chalk line upon the bark, which has been first "rossed" with the axe or adze, and is then notched down to the line, as shown in figure 6, at intervals of one or two feet—the distance depending upon the difficulty or ease with which the wood is split. The slabs between the notches are split off with the axe, as seen at the upper end of the piece shown in the figure.

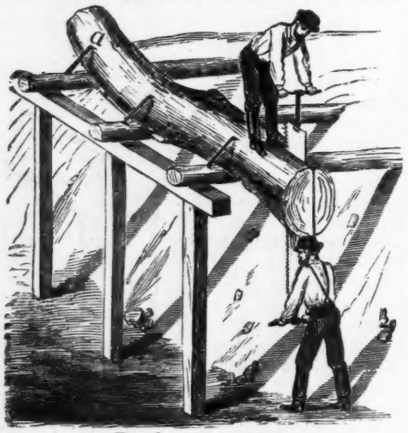


Fig. 8.—THE SAW-PIT.

When all the slabs are split off, the surface is hewed smoothly with the broad-axe. This is being done on both sides, the timber is laid down, and the edges are treated in the same manner. Where there is a hill-side, a saw pit may be made, as shown at figure 8. A few posts are set in the ground a short distance down the hill, and a timber is mortised or bolted upon them. Three or four timbers are laid from the bank so as to rest upon the frame below, as shown in figure 8. The log is rolled on to these cross timbers, and blocked or spiked fast with the dogs. A whip-saw is used to bring the timber into a finished condition. When the saw reaches one of the cross pieces, the log is lifted with bars so as to free the timber, and it is moved from before to behind the saw, and so on until the work is complete. Where a mill is distant and time can be devoted to it, a saw-pit of this kind may be made very useful upon many farms where there is timber to be cut for buildings, fences, posts, or other purposes.

Plan of a Saw Mill.

Several correspondents have requested a plan for a saw mill. This is an evidence of the fact that the *American Agriculturist*, while it is still, as it always has been, a journal for farmers and others engaged in the different branches of agriculture, is also extensively read by persons occupied in mechanical and other industries, many of whom are engaged in lumbering and saw-milling. When one of the common run of saw mills is examined by an expert at this business, there is evident a very frequent want of convenient and economical arrangement, and a great waste of power, both in consequence of the bad arrangement and the cumbrous, heavy, ill-constructed, machinery used. The old-fashioned overshot wheel, which utilizes only 50 per cent, or less, of the power, is generally found in country mills, in place of iron turbine wheels of the best construction, by which 75 per cent of the actual power is utilized, or instead of a well constructed steam engine, which can be fed and run at an almost nominal expense, by using the sawdust and other waste of the mill, and is not stopped by low water or freshets. The cheapest is not always the most economical. Utility and economy in use are to be considered before cheapness in the first cost, and there are now so many improvements in machinery, that can be had at so little comparative cost, that the miller can not afford to do without them. As an instance of this might be cited the "self-sets," by which, at one movement of a lever, or a winch, or in some by an automatic movement, the log can be set precisely at the proper point to cut a board or plank of any required thickness, with certainty; while by the ordinary "setting-bar" time must be taken to loosen the "dogs," move the log, adjust it by a measure, tighten the dogs, and then repeat all this at the other end of the log; in the meantime the machinery has lost its momentum, and time must be given to restore this. The cost of the "self-sets" may be saved in a one-saw mill in one month, by the mere gain of time.

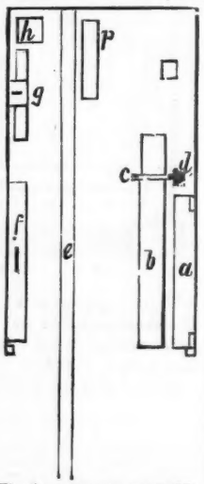


Fig. 1.—PRINCIPAL FLOOR.

The plan here given is for the interior arrangement of a cheap frame mill, to be run by water or steam-power. The building is intended to be made in a bank or hill-side, so that the upper floor may be on a level with the log yard or pond and rollway, and the basement may be occupied by lath and shingle mills, and the engines, if steam-power be used. In this case the boiler would be placed in the cellar, and all the waste of the mill would be carried through well-holes, slides, or hatchways, to the furnace. The principal floor is shown at figure 1. This is open at the front for seven feet in hight, and may be closed by drop doors. The floor should be at least 30 feet wide for a mill having all the machinery which is necessary to economical working. The length will have to be in proportion to the kind of timber sawed. A carriage of 30 to 36 feet long, will necessarily require a mill of at least double that length, and if any other machinery is used upon this floor, additional room will have to be provided for it. In the plan here given, the log-way (*a*) is at the side. The logs may be rolled in to the mill from a skid-way at the side, or may be drawn in at the front by means of a "bull wheel" and chain at the rear of the log-way. The carriage (*b*) is mounted on wheels, and runs on rails, by which less power is required than when the slide-ways are used. The saw (*c*) is either a gate, a muley, or a circular saw; where hard wood is chiefly cut, the first is generally used, as being less likely to "run," than the muley or the circular saw, and needing less skill to work one passably well. At *d* is the gearing for the feed, and at *e* is the board-car and railway upon which it runs, either to the board piles in front or rear of the mill, or to the planing mill (*p*) in the rear. The rough edged boards from the sides of the logs, are edged on the table (*f*), and the slabs are run upon the board-car to the slab-saw (*g*), where they are cut into 4 feet lengths and thrown down the well (*h*) and slide (*i*) to the floor below, to be cut into laths. The edgings and thin slabs, when steam is used, are thrown down a hatchway to the cellar, where they are consumed under the boiler. Figure 2 is a plan of the lower floor, upon which is the slide (*i*) for the cut slabs, the "bolting" saw, and the lath-saw (*j*). In the rear of each of these saws a "horse" (*k, l,*) is provided, upon which the bolts and laths are placed as they are sawed. When a bundle (50 or 100) of laths is sawed, they are tied up and the bundle placed upon a pile near by. A shingle mill may be placed at *q*, and supplied by the best of the slabs. The waste from these saws goes down the hatchway (*m*) into the cellar. The steam-engine (*o*) is above the boiler, and the large pulley and gears (*n*) are below the saws. Where the mill is run by water-power, this waste should be run out upon a truck and railway to a safe distance, where it is burned every day, so that it may not accumulate and endanger the mill by risk of fire. The shafting by which these saws are run, should go under the floor so as to avoid accident. There is now a great economy in purchasing what are known in the trade as complete saw mills. These are furnished by the manufacturers complete in every detail, from the engine and boiler to the belting by which the machinery is operated; so that it is only necessary to provide a suitable building to hold the machinery. There are several manufacturers who make a special business of supplying the machinery and fittings of saw mills, from whom estimates may be procured for outfits of all kinds, from the most simple up to the most complete.

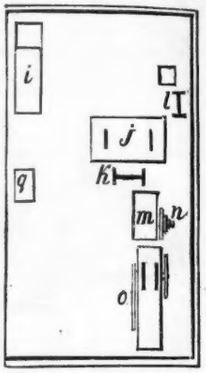


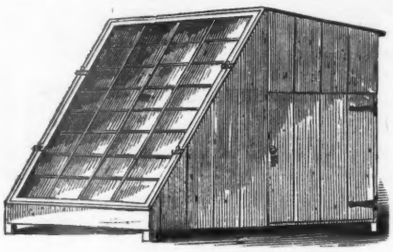
Fig. 2.—LOWER FLOOR.

NO NEED FOR INTERIOR FENCES.—The interior fences of farms occupy more space and cost more money, than the outer fences, while they are almost entirely unnecessary. In the majority of cases pasturing the cultivated land costs many times more than the little gain derived from it. The pasturing of mowing lands, and newly seeded stubbles, as a rule, is very injurious, and when, under exceptional circumstances, this is desirable, a temporary fence, of portable hurdles, might be profitably used. It may be beneficial to have a permanent pasture lot upon every farm, and where there is a roughish piece of land, it may be so used. But it will be found far more profitable to fence a

small plot in a convenient place for the stock, and feed them there with green-fodder grown and cut especially for them, than to make a practice of indiscriminate pasturing, with the necessary maintenance of interior fencing at a high cost.

A Hatching Coop for Winter Use.

Early chickens are very desirable, but they are troublesome to raise in the winter. To overcome the difficulty, and keep the young chicks sufficiently warm during very cold weather, we have provided a few coops of the style shown in the accompanying engraving. It is 4 feet long and 3 wide, and 4 feet high, which is large enough to give ample ventilation when it is temporarily closed. The nest is



A HATCHING COOP FOR WINTER.

made in one corner of the coop, and when the chicks are hatched, they may be confined in it when necessary. The front is a common hot-bed sash, 3x4 feet, and can be raised or removed at pleasure. The coop is placed in a corner of the poultry-house near the glass front, and being thus thoroughly warmed during the day, will retain sufficient warmth during the night. In the coldest weather a blanket or mat may be thrown over the coop.

A Village Improvement Association.—What has been Done in Litchfield, Ct.

In several villages of New England, there have been established of late, what are known as Village Improvement Associations or Companies. These consist of a number of public spirited, energetic, and liberal people—both ladies and gentlemen—who associate themselves under the operation of a State law, which regulates the formation of joint-stock companies without capital, for the purpose of improving the condition of the streets, sidewalks, crossings, public squares, fences, shade-trees, and other conveniences and adornments of the villages. Every resident of a village knows how slowly reforms and improvements of this character are effected, and how difficult it is to induce some persons to see their interest in beautifying or improving, either their own or the public property. It is true, what is the business of nobody in particular, goes undone very easily, and that it is only by a great effort on the part of the more enterprising and enthusiastic citizens, that the indolence, or inertia rather, of the majority is overcome, and a course of improvement is set in action. The benefit accruing from the precept and examples of these enterprising people, are very great indeed; cleanliness, neatness, and order, are provocative of sobriety, industry, and thrift, and these again, tend towards a higher condition of morality. So that morality and comfort, as well as agreeable appearance, if not elegance, result from the operation of these village improvement associations. While they are desirable everywhere, they are still more useful and effective in those places where a large portion of the summer business is, to entertain strangers from the large towns and cities. These people are greatly attracted by clean streets, smooth walks, green lawns, bright gardens, neat houses, and the certainty of general order and respectability which these things indicate. Without distinguishing any one place in particular, there are many such villages as are referred to, which at first sight put the stranger upon good terms with them; while there are many which sadly need the reforming influence of an improvement society, for their own good and for the comfort of those who visit them. For the benefit of the latter we give some account of the operations of the Litchfield (Conn.) Village Improvement Company. What has been done will speak for itself, and may serve to form a model for other villages to copy.

This Association was formed in April, 1875, and consisted at first of about 100 members. The first season there was expended $2,147.78 in the following manner: 10,478 feet of concrete side-walk was laid; street crossings were made of stone, where formerly there was deep mud in wet weather, and deep dust in dry weather; seats were put up in the public parks; wooden bridges, (culverts we suppose are meant), were made; rubbish was removed, and railings were repaired. To meet these expenses $1,412.29 was raised; of this sum, $177 was from members fees; $714.08 from entertainments of various kinds; $129.83 from donations, and $391.38 from repayments for side-walks. A debt was thus left to be carried over to the next season. The entertainments consisted of lectures, readings, and strawberry festivals, and were certainly liberally patronized. These, in themselves, where undoubtedly valuable aids to improvement, though not included in the original bill. In the winter of 1875—'76, walks were cleared of snow, and such shade trees as were broken or endangered by a severe ice storm, were trimmed. $567.59 was expended that winter. During the second year $2,214.91 was expended and the sum of $1,923.69 was raised by similar methods to those already mentioned.

Besides all this work, much was done by private individuals, in emulation of the Improvement Company. Thus the example given by the Association, has led to a general disposition to improve the condition of private property, and as nothing is more infectious than a taste for flowers, green lawns, neatly kept foot-paths, and fences, the desire to improve spreads beyond the village, and the farmers outside begin very soon to adopt the general custom. It is easy to conceive how far this may go when it is once started, and what an immense influence for good is exerted far and wide. In beginning this improvement, it is the first step which is the most difficult, and this must be taken by one energetic and experienced person. This was the case in the instance here referred to, but it was fortunate that his efforts were readily supported by others. It is to be hoped that this example may be copied in many villages, and although it may not always be possible to enlist so large a company of helpers, yet a small beginning should not lead to discouragement, as proportionate success may be achieved. The profits resulting from these improvements, are far greater than the original cost. Not only is there a direct value received for the money expended, in the increased worth of the property benefited, but there is, besides, not estimating the resulting comfort and satisfaction, a large extra value added. A well kept garden, neat fences and gates, and shade trees, add to a village lot or a farm, many times their cost, so that no more profitable outlay than this can be made.

A Bolster Spring for Farm Wagons.

A new Bolster Spring is shown in the accompanying engravings, which possesses several good qualities, not the least of which is, that a set may be bought at a moderate price, and attached to the

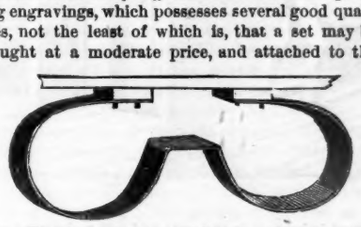


Fig. 1.—SPRING FOR WAGON BOLSTER.

wagon by the farmer himself. The desirability of having springs to wagons for heavy work need not be urged; the saving in wear and tear of both wagon and wheels is large on even good roads, and as our roads are generally the reverse of good, there are but few localities in which these springs would not pay for their cost in the increased durability of the vehicle. The springs, figure 1, are attached to the wagon-box, as shown in figure 2, and rest upon the bolster; such is their shape, that the box is raised only three inches *above* the bolster. The springs can not break, as before their whole tension is exercised, the weight of the load rests upon the bolster, and thus the springs are relieved from sudden jerks caused by stones or

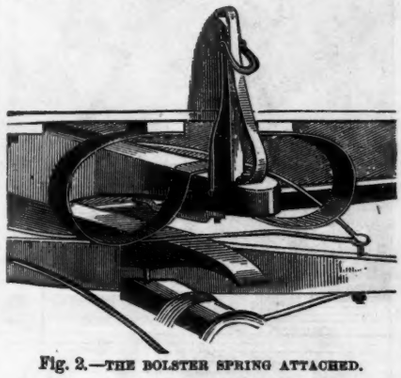


Fig. 2.—THE BOLSTER SPRING ATTACHED.

ruts in the road. The use of these obviates the necessity for having springs to the wagon seat; they are made to carry from 2,000 to 5,000 lbs. the set. This very recent invention, which will meet a general want, is just brought out by the makers, Semple, Birge & Co., of St. Louis, Mo., widely known as builders of wagons and farm machinery.

The Hereford Breed of Cattle.

BY T. L. MILLER, BEECHER, ILL.

In an article in the *American Agriculturist* for November last, accompanying an engraving of the Hereford bull "Little Bill," it is stated that the Hereford is "second only to the Shorthorn as a beef animal, when kept under equally favorable circumstances." I have now been a breeder of Hereford's for several years, *and there is no place* where the Shorthorn can excel the Hereford. The Shorthorn shows at his best when on the richest food, and all he will take of it, from the time he is dropped until he goes to the butcher. Even here the Hereford will make as large gains as the Shorthorn, and do it on twenty-five per cent less feed. And the larger portion of the writers on cattle, when they touch this point at all, admit a difference in favor of the Hereford. The only place where the Hereford and Shorthorn have an opportunity to test this, has been at the celebrated cattle fairs at Smithfield, Eng. For nearly the whole time, from 1799 up to 1851, the two breeds were shown in the same classes—in fact, all breeds were shown together—and the Hereford oxen, or steers, as fat cattle, took 185 premiums, as against the 82 by the Shorthorns. The Herefords were formed in the hands of Mr. B. Tompkins, commencing in 1766, and fairly established 1776—about the same time Charles & Robert Colling were improving the Shorthorns. As a rule, the feeders and breeders that show at Smithfield, have fed high, and it is fair to presume that the two breeds have made the best weights and quality that could be made, while the Herefords took nearly twice as many premiums as the Shorthorns, and nearly twice as much money. If the test could have been made as to the cost of producing these weights, then the Herefords would have shown at least twenty-five per cent better than the Shorthorns, and many of the feeders of Herefords would claim a greater difference than this. A late Shorthorn paper admits these facts in favor of Herefords at three years and over, and claim an advantage for the Shorthorn at two. The same article admits that Hereford beef in the London market, at three and over, is worth more than Shorthorn beef, and that every where *good* butchers will pay more for Hereford than for Shorthorn beef. Now, what are the facts, we will take Smithfield again. The beef steers are

shown in classes as follows:—Under 2 years and 6 months; over 2 years and 6 months, under 3 years and 3 months; over 3 years and 3 months, under 4 years and 6 months. In 1869, in the youngest and oldest classes, the Herefords were the heaviest, but the difference of weight at the Smithfield between the Herefords and Shorthorns, is trifling, and is as often with one as the other. The great difference between the Hereford and Shorthorn is in the cost of production and the value of the product. The cost of production is one-fourth in favor of the Hereford. The product is worth from ten per cent to fifteen per cent in the Hereford more than in the Shorthorn steer, and these points should always be borne in mind. And again, the Hereford can be grazed and fitted for the butcher on pastures that would not keep a Shorthorn even in good store condition. These facts can be sustained.

[While Mr. M. may believe the above to be all perfectly true, yet the fact that there a are hundred Shorthorn herds in existence for one of Herefords, must be taken to prove that, for some very good reasons, the Shorthorn is superior to the Hereford. Fashion must have something to back it.—ED.]

The Process of Cheese Making.

The establishment of the factory system in the cheese dairy, has made no change in the method of producing the curd from the milk, or the cheese from the curd. The improvements have been wholly in the machinery used in the processes; and in this respect the apparatus of the factories is constantly changing for the better. New contrivances for performing labor more easily, or for securing greater cleanliness or effectiveness in the methods of the dairy, are appearing almost daily, and in this respect dairying is not at all behind any other skilled handicraft. But to curdle the milk, rennet—the stomach of the calf—is still used; and the curd is heated in the vats, broken up; drained, ground, salted, and pressed, the same now as in the old-fashioned dairies. The greater economy of labor in the factory, however, is seen at once in glancing over the apparatus used. After the receiving and weighing of the milk, as shown in an illustration upon page 53, it is run into vats, which hold about 600 gallons each. In these the milk is warmed to about 80°, the proper temperature for coagulation; it is then well stirred to ensure the even distribution of heat, and the rennet is added and thoroughly mingled by stirring. The curdling is complete in 40 to 60 minutes, when the mass is stirred, or broken (fig. 3), by a many bladed curd knife into small blocks to facilitate its separation from the whey. When the curd has acquired sufficient firmness, it is more thoroughly broken, either by the hands or by what is known as an agitator. After the curd is broken up, heat is applied by means of steam pipes until the whey and curd together are brought to a temperature of about 100 degrees. During this heating the curd is stirred, and after the "cooking" is complete, it is left to rest, with occasional stirrings, until a proper degree of acidity, or rather approach to acidity, is observed in the whey. The whey is then drawn off, and the curd is heaped in the vats and left to become sour. Upon the exact degree of acid that is developed in the curd, depends, in a great measure, the quality of the cheese; and the skillful practice of an experienced cheese maker is perhaps more needed just here than in any other part of the process. Those who need it can use what is known as the hot-iron test; this is to take a bar, or rod, of iron heated to a point somewhat less than a dull red heat, and bring it into contact with a piece of curd. If, when the hot-iron is drawn from the curd, it brings with it a quantity of glutinous strings, the curd is ready for removal from the vats. It is dipped out from these with the curd dipper, a pail having a flat side, into a cooler, the vat being tipped by means of winches. This is shown at figure 4. The curd is left here to cool for a few minutes, when it is turned over and again left, to acquire a certain mellowness. It is then pressed for 10 minutes, when it is taken out, ground in the curd mill, (fig. 5,) and salted; two pounds of salt being used for 100 pounds of curd. The proper temperature of the curd is kept up during these processes by covering it with a cloth. After having been ground, and salted, the curd is put into the presses, (fig. 6,) in which it remains under pressure for two or three days. The pressure, which is regulated by means of a screw, should be sufficient to force out the whey, and consolidate the cheese. It is obvious that much tact and experience are needed to produce cheese of first quality, when it is considered what a multitude of interfering and complicated changes may occur in the condition of the curd, through atmospheric effects, the quality of the milk, or the rennet, or unavoidable difficulties in securing the precise degrees of heat or fermentation of the curd. But in the well managed cheese factory all danger of failure is reduced to a minimum, as compared with the chances of a hundred small dairies all differently managed, and without the machinery needed for accurate manipulation. It is on account of this uniformity in quality that the American factory cheese fills a place in the markets of the world that no other dairy product has ever done, or is likely to do.

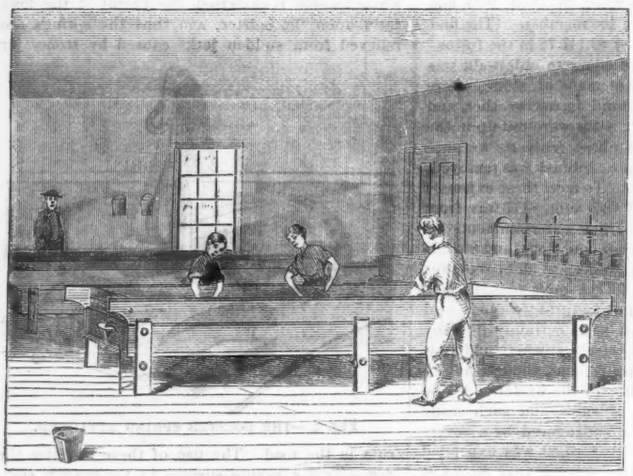


Fig. 3.—STIRRING THE CURD.

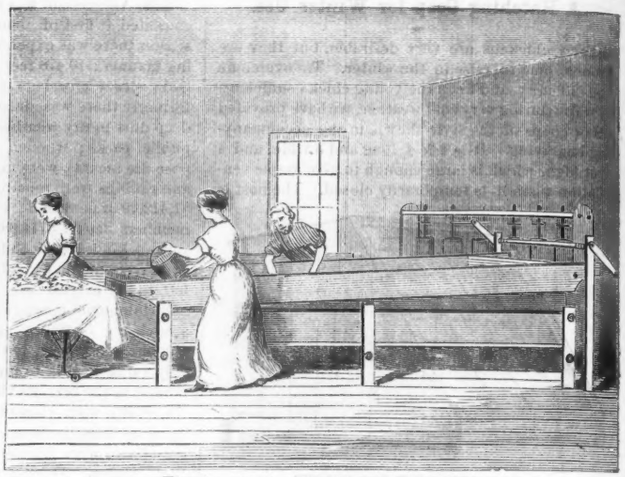


Fig. 4.—TAKING CURD FROM THE VATS.

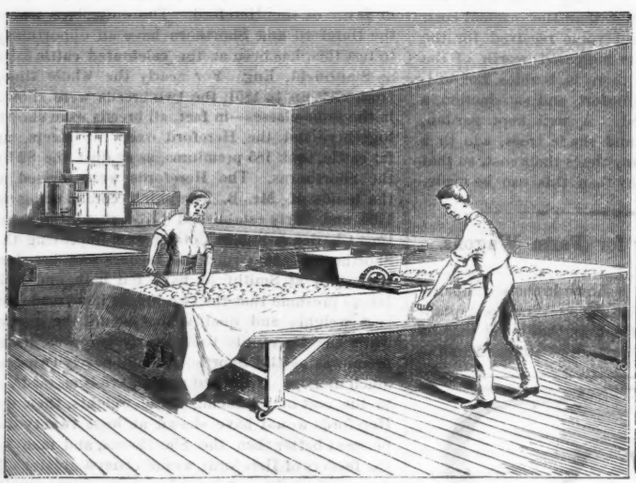


Fig. 5.—GRINDING THE CURD.

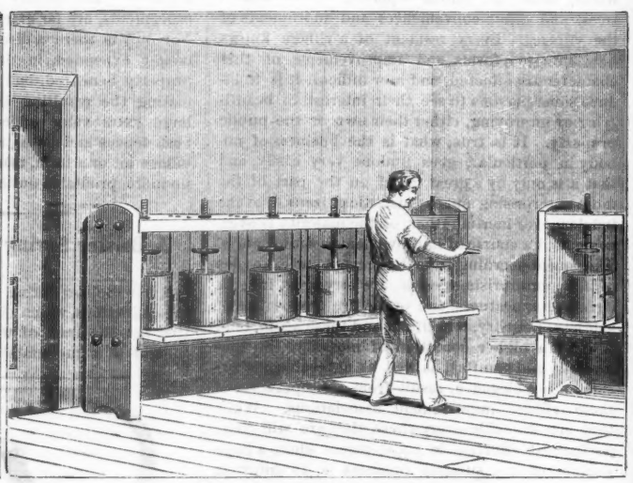
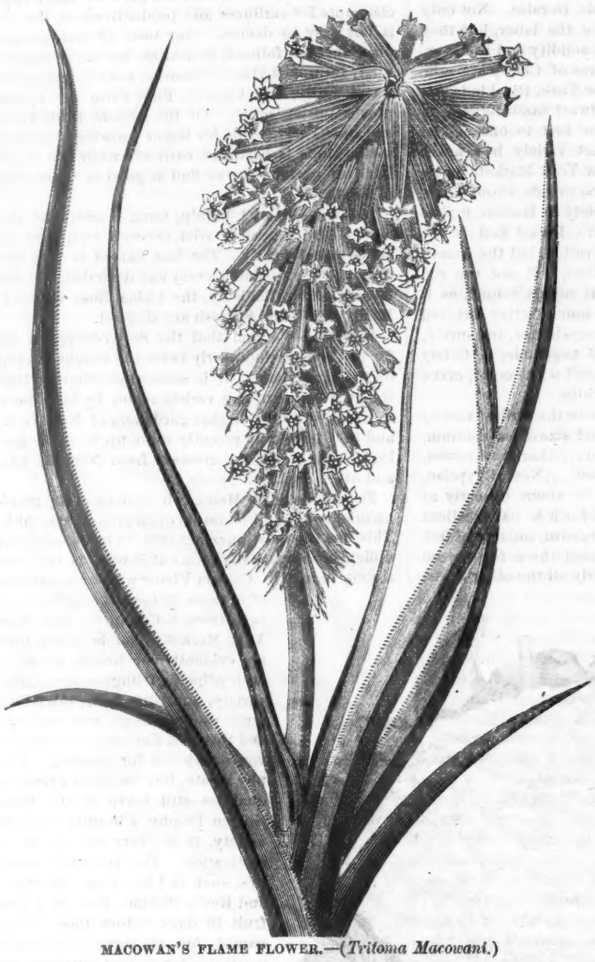


Fig. 6.—PRESSING THE CHEESE.

Macowan's Flame Flower.

The well known *Tritoma Uvaria*, its varieties and allies, is justly valued for its brilliant spikes which give a brilliancy to the garden in the autumn months. We are indebted to England for the common name, "Red-hot Poker Plant," which is more descriptive than elegant, and when the English, as we see by their journals they are disposed to do, change this awkward name to "Flame Flower," we are quite ready to accept the amendment, with thanks. The plants were originally placed in the genus *Kniphophia*, but later a portion of them were separated to make another genus, *Tritoma*. We notice that English writers are of late inclined to restore these, and to call them all *Kniphophia*. As the name *Tritoma* is well established in our gardens and catalogues, we retain it until we can examine into the reasons for discarding it for the other. Our purpose is not to discuss names, but to call attention to a new species, so recently introduced into cultivation, that it is quite a rarity abroad, and which we saw last October flowering finely in the hardy herbaceous collection of Messrs. Woolson & Co., Passaic, N. J. This species was discovered by Prof. Macowan, in the mountains of South Africa, at an elevation of 4,500 feet above the sea, and was named in his honor, *Tritoma Macowani*. With the same general appearance as the tall-growing *Tritomas*, which have been so long in cultivation, it is much more delicate, and smaller. The leaves differ from those of the other species in being more rigid, and in having their edges roughened by minute teeth. The flower stems are not much over a foot high, (the English descriptions say from 1 to 2 feet,) and bear at the summit a spike of reflexed flowers, which, while they have not the firey aspect of the other species, are sufficiently brilliant, being of a very rich and soft orange color, which is very pleasing. The plant seems to be a remarkably free flowerer, and its season is evidently a long one. The stems of tall species, unless staked, are apt to be bent by the weight of the flower spikes, and the autumnal storms frequently make sad work with them, accidents from which this species is likely to be free. When first introduced into England, it was grown only as a conservatory plant, for which use it is well adapted. It has proved quite hardy with Herr Max Leichtlin at Baden Baden, Germany, and in some English gardens, and will be tested by Woolson & Co. the present winter. The other species of Flame Flower are usually hardy in the climate of New York, if given a covering of litter, and this species of Macowan is so desirable that, if not absolutely hardy, it will be worth the slight protection required by the others.



MACOWAN'S FLAME FLOWER.—(*Tritoma Macowani.*)

A New Coleus.—C. Multicolor.

BY W. C. BARRY, ROCHESTER, N. Y.

[Last fall we saw at Ellwanger & Barry's a new Coleus, which Wm. C. and Charles Barry, who had recently returned from Europe, had brought over "by hand," so to speak, as they had cared for it in their state-room during the voyage. The variety being quite new, we requested Mr. Barry to furnish us, when the plant should be sufficiently recovered from the effects of travel, with materials for an engraving; this he has done, and at the same time sends the accompanying notes.—ED.]

Of the many Plant "Novelties" which I had the pleasure of seeing while abroad the past summer, I think that the most interesting and valuable was *Coleus multicolor*. Interesting, because of its curious, distinct, and beautiful foliage; valuable, for the reason that in this climate the Coleus is deservedly one of the most popular of ornamental-leaved bedding and pot-plants; and being easily propagated, a sufficient stock is quickly obtained to meet the great demand which a desirable novelty like this is sure to create. The now well-known variety called "The Shah," which for some time after its introduction seemed to be "under a cloud," has at length proved to be invaluable for bedding out as well as for pot culture. The "Chameleon," another beautiful variety, about which there was some question as to its value, has won its way to popular favor, and is now considered indispensable in every collection. The new species, the form of which is represented by the engraving, is very appropriately called *multicolor*, on account of the many colors which are presented in its leaves. Although quite distinct from either of the varieties mentioned above, it seems to partake to some extent of the peculiarities of both, so much so as to suggest that it may have originated from them. It is claimed for it, however, that it is a distinct species, and a native of the Solomon Islands. It was introduced to the trade last spring by the celebrated firm of Veitch & Sons, London, who describe it as follows:—"In form the leaves differ chiefly from the usual type in having the teeth of the edges greatly elongated and rounded at the tips. In color it is remarkable for the number of rich shades of crimson, red, rose, etc., into which the leaves sport; some of the young leaves having also a bright yellow for the ground color marked with rose or red. All the shades of color in the foliage contrast finely with the bright green of the stem and foot stalks. It is a very beautiful plant, and will be found among the most useful of its tribe for decoration. It received a First Class Certificate from the Royal Horticultural Society, May 2nd. Also a Certificate of Merit from the Royal Botanic Society, April 18th."

All who have seen the new Coleus pronounce it a valuable acquisition to the list of plants with orna-

MANY-COLORED COLEUS.—(*Coleus multicolor.*)

mental foliage, and if we mistake not, it is destined to meet with a cordial reception in this country by all the lovers of new and beautiful plants.

Experience With Vegetables in 1877.

BY PETER HENDERSON.

[As an aid to those who, bewildered by the great variety offered by the catalogues, find it difficult to make a selection of vegetables, we have usually given in February a list of those we regard as reliable. While it is desirable that the main crops should be of sorts, the value of which is well established, we would not discourage the trial of novelties, of which many are offered every year, the testing of these in comparison with the older kinds adds much to the interest of gardening. This year, Mr. Henderson gives us the results of his experience, which in the main agrees with our own.—ED.]

For a number of years past we have set apart a piece of our ground on Jersey City Heights, N. J., for testing the relative merits of all the leading kinds of vegetables in general use. Every class is treated exactly alike. All of each class are sown the same day, and in every subsequent operation, the greatest care is taken that all are treated alike, whether sown in hot-bed to be transplanted, or when sown in the open ground. Our "Trial Book" shows the following results of the various tests. We name, however, only the varieties having merit, all such as were tested and found to be inferior either in earliness or quality, are either not named here at all or merely noticed to indicate, wherein, in our estimation, the want of merit lies. About an average of 25 varieties of each kind of vegetables were tested, and at least 50 plants of each variety:

Beans, Bush.—Early Mohawk is a few days earlier than Valentine, which is yet the best for general crop. Black Wax is a fine stringless variety. Refugee, late and largely used for pickling.

Beans, Pole.—Large Lima is still the favorite. Dutch Case Knife is also an excellent sort, and the Giant Wax is a stringless snap bean, but a climber.

Beets.—For first early we find Egyptian best, next the Blood Turnip, and for late the Long Blood. Bassano is early, but objectionable for market, on account of its very light color.

Mangels and Sugar-Beets.—In an impartial trial of the four best known sorts, Norbiton Giant gave 20 per cent more weight per acre than any other.

Cabbages.—The seeds were sown in hot-bed on March 1st, and the plants set out in the open ground the first week in April. The Early Wakefield still stands unrivalled as earliest and best of its size, it being in fine marketable order on June 15. Early Summer, however, that came only one week later, was double the weight, and equally uniform in heading. This we find is becoming the favorite large early variety in almost every section of the country. It has only been introduced into general cultivation within the past four years, though it has been grown for nearly 20 years by one of our best Long Island farmers, who had a monopoly of it up to that time. Next in value, as a second early, comes the Winningstadt, a well known pyramidal-shaped variety of great solidity. Next in order came Early Flat Dutch, which, by middle of July, gave heads of 15 lbs. weight. For the fall crop, (seed sown in May,) nothing is found better than Premium Flat Dutch. A correspondent in Pennsylvania writes that a field of 5 acres averaged 14 lbs. per head. American Drumhead Savoy is best in its class. Of cabbages for pickling, we find the Blood Red Erfurt by far the best colored.

Carrot.—French Forcing, earliest, and handsome, next Early Horn, and a newish sort called Half Long Red, of very bright color, and excellent flavor. For field crop, Improved Long Orange is best.

Cauliflowers, (sown and planted at same dates as the cabbages.)—The new variety known as Early Snowball, is the best acquisition of the season. It was a week earlier than all other sorts tried; heads of fine size, of snowy whiteness, few and short leaves, making it in every way desirable, whether for growing under glass or in the open ground. Next to this was the Extra Early Erfurt, hitherto considered the best variety. Later, for succession, came Half Early Paris, and Le Normand's Short Stemmed, too late for early, but valuable as a fall sort.

Celery.—Probably in no vegetable cultivated has the variety so much to do with success as Celery. Our own experience, and that of scores of our immediate neighbors, is that nearly all the giant or tall-growing kinds are unprofitable to raise. Not only does their culture entail twice the labor, but they are almost always wanting in solidity and in flavor. While some hundreds of acres of Celery are now grown for the market of New York, the kinds are mainly the Half Dwarf and Dwarf Sandringham, in the proportion of four of the first to one of the second. The Boston Market variety has never been a favorite for the New York Market, as its tendency to throw up suckers, or side shoots, considered the merit of that variety in Boston, makes it objectionable here. Hood's Dwarf Red is the best variety of Celery in cultivation, but the American public, with few exceptions, will not use red Celery, while in England it is highly valued, as it should be, for it is not only much better flavored than the white sorts, but it keeps better, and surely, when used as an ornamental vegetable, as Celery often is, its bright crimson, and white color, make it more attractive than the white.

Corn.—Minnesota we find to be the earliest variety of good size. The habit is dwarf, size of ear medium, very productive, and sweet.....Large 8-rowed, second early, large size, sweet.....New Egyptian, this variety is of large size; is about as early as 8-rowed. The merit claimed for it is its excellent flavor. It has been but little grown outside of Baltimore, but has been cultivated there for several years to the exclusion of nearly all the other sorts.

EARLY SNOWBALL CAULIFLOWER.

.....Stowell's Evergreen for late main crop we find nothing yet to supersede this old and reliable kind.

Cucumbers.—Early White Spine, and Green Prolific, were earliest and most prolific, while for pickling, Early Cluster and Short Green seem best.

Egg Plant.—New York Improved is rather earliest, but Black Pekin is to our taste the best flavored—they are nearly alike productive.

Endive.—Moss Curled, Green Curled, and Batavian.

Lettuce, (sown and planted same date as cabbage.)—We find All the Year Round (one of the cabbage or Butter class) headed first. Next came the Simpson, and next for standing the hot weather best were Large White Summer, and Curled India. Boston Market, though rather small for out-door culture, is now almost exclusively grown as the best for heading under glass.

Musk Melons.—White Japan proved earliest, but for general crop Nutmeg and Green Citron are preferable. Cassaba is a large yellow kind; is of excellent flavor, and very prolific.

Onions.—Wethersfield Red, Yellow Danvers, and White Globe, are probably the best of their colors, for general culture, though the newer kinds of the Italian varieties, such as White Tripoli, Queen, and Giant Rocca, grow finely in South and South-westerly States.

Parsnip.—Hollow Crowned.

Parsley.—Moss Curled and Double Curled.

Peas.—These, like Tomatoes, have so many new claimants for earliness and productiveness, that it is not easy to decide. Our tests of last season place them as follows, as near as we could judge: First, Improved Dan'l O'Rourke, next Philadelphia Extra Early, and Carter's First Crop for round peas requiring brush. Of the Dwarfs, Little Gem and Blue Peter, while for larger growing wrinkled sorts, Alpha is best and earliest; while for main late crop nothing yet we find as good as Champion of England.

Radishes.—Scarlet Turnip, Long Scarlet, and the new White Tipped Scarlet, (French seed,) are all about equally early. The last named is very distinct and pretty, and in every way desirable. Of the late or winter Radishes, the China Rose Colored, Black, and White Spanish are all good.

Spinach.—We find that the Savoy-leaved is by far the best, giving nearly twice the weight of crop on the same space. It is somewhat singular that the great value of this variety seems to have been overlooked by the market gardeners of New York, and they have only recently woke up to it on seeing it sent in by the growers from Norfolk, Va., and other Southern points.

Tomatoes.—Sown March 5th, were carefully transplanted twice, and set out in open ground May 20th. This was the most puzzling trial we made, as it was difficult to impartially pick out 3 or 4 as the best among so many. Canada Victor was, by a majority of censors, judged the earliest and best, though Conqueror and New York Market resemble it, and they are evidently all nearly allied to each other. Arlington, a valuable variety, but little later, is exceedingly prolific, large, and smooth, and this and Excelsior are the favorite varieties for canning. Trophy is late, but its other excellent qualities still leave it the field. Golden Trophy, a beautiful yellow variety, is in every way worthy of cultivation. The very early varieties, such as Little Gem, 100 Days, and Key's Prolific, ripened a few fruit 10 days before those above named, but all these varieties are worthless for market purposes, because the difference in earliness of 150 miles farther South, brings in the finer sorts, cheap enough to take their place until the better sorts ripen. I have but little hope in any farther improvement in earliness of the Tomato. We have made no advance on Key's Prolific, sent out 7 or 8 years ago, and that earliness was at the expense of both size and quality, while in the good market sorts it is doubtful if there is anything much in advance of a good stock of New York Market, which has been in culture for 25 years.

Turnip.—Red, and White-Top Strap-leaf are earliest. Purple White Globe is nearly as early, and will prove a more marketable sort from its larger size. Yellow Globe, for second early, is one of the best for general crop. In *Ruta Bagas*, the American grown seed of the Purple and Green Top kinds proved better in every case than some half dozen kinds of imported varieties tried, with the exception of the Long White French, a variety of excellent flavor, and otherwise desirable.

The Fern-Leaved Trumpet-Flower.

Last spring, Mr. John Saul, of Washington, D. C., who has a way of sending out novelties at a very early date, sent us, among other new plants, a specimen of *Campsidium filicifolium*—a good deal of a name for such a bit of a plant, as it was. We knew

it was one of the new plants for which Mr. Bull had certificates from the London Societies, but did not give it special attention at that time. Indeed, the *Campsidium* went quite out of mind until last fall, when at Rochester, Mr. W. C. Barry called our attention to some fine specimens in the extensive greenhouses of Ellwanger & Barry. Mr. B. was quite enthusiastic over its beauty, as well he might be, and predicted for it great popularity. When we returned home, we looked for our own specimen, that came from Mr. Saul, and were glad to find it had grown to a vine two or three feet long, and clothed with leaves of the most graceful kind. The engraving will show the character of the foliage; according to the English catalogues, the leaves grow to the length of about five inches, though on our small plant they are only about half that; each leaf consists of six to twelve pairs of small leaflets, with a terminal one, these leaflets are lobed and toothed, and, being of a fine green color, the foliage has a strikingly fern-like aspect, and reminds one of some of the aspleniums. Its very beautiful foliage, and the delicate, twining stem, makes the plant a most admirable one for decorative work, especially for vases and baskets, where it can hang gracefully down the sides. It is suited to many of the uses, to which *Myrsiphyllum*

FERN-LEAVED TRUMPET-FLOWER.

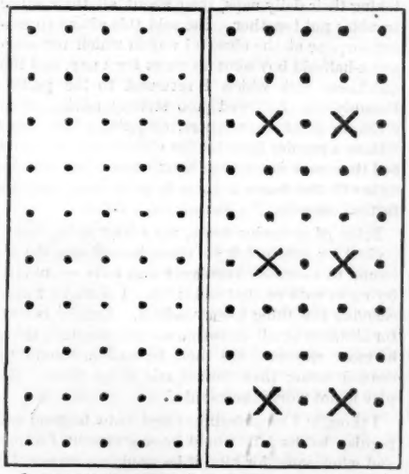
(Smilax) is put, and is superior to that in the greater delicacy and variety of its foliage. We notice that in England it is classed with the stove-plants, but ours appears to flourish in the greenhouse. It is said to bear cutting well, pushing out a new growth freely after it had been cut back; another point in its favor is the ease with which it may be propagated from cuttings. Should it become as popular as it promises to be, no doubt our florists will soon find the best manner of managing it, to supply it in such quantities, as they now do the deservedly popular "Smilax." The plant is a native of the Feejee islands. A word as to the name we have adopted. The flower is not known, and when the plant was received in England, it was called a *Campsidium*, from its resemblance in habit and foliage to other species of that genus, and the descriptive specific name, *filicifolium*, or "fern-leaved," was given to it. But the best botanical authorities do not admit *Campsidium* as a genus. Bentham and Hooker find that it is not distinct from *Tecoma*, the genus of our "Trumpet-flower." Hence if, when the flowers and fruit are known, it should be found that its relationships were properly inferred, from its foliage, its correct scientific name will be *Tecoma filicifolia*, which readily Anglicises into "Fern-leaved Trumpet-flower," a name under which it will stand a much better chance for popularity, than if it is to be *Campsidium filicifolium*. But our name, like that, depends upon an *if*.

THE PAMPAS GRASS.—The plumes of this stately grass have been sent from California this fall in large numbers, to New York and other Eastern cities. Nothing can be finer in the way of ornamental grasses, than these spikes, about a yard long, of a dense wavy mass of silken florets and hairs, of nearly pure white. This grass (*Gynerium argenteum*) is dicœcious, the pistillate or female spikes, being greatly inferior to the staminate in size and silkiness, so much so that some dealers supposed that another grass had been sent to them. The Pampas Grass must be cultivated largely in California, probably expressly for these plumes, which appear as if they had been exposed to sulphur fumes, as they are much whiter than we have seen them elsewhere. The first consignment sold at $3 for a pair of plumes, but later they came in such quantities and so variable in quality that dealers offered them at $1 and less. This grass is scarcely hardy at New York, though it may usually be kept through the winter by giving the roots a covering. A cask placed over the clump, filled with leaves, and covered with boards to shed rain, makes a not very sightly, but an efficient covering.

A Double Crop—Cauliflower and Lettuce.

BY PETER HENDERSON.

In the vicinity of our large cities there are acres of glass devoted to the forcing, or forwarding, of lettuce, radishes, etc. The principal crop, however, is lettuce, which is raised during the winter months, either in the old-fashioned hot-beds, heated with stable manure, or else in the more recent greenhouses, heated by hot water pipes. But by far the largest quantity of early or forced lettuce is grown in the "cold frames," such as are used for keeping the plants over winter. These are simply two boards set on edge, and placed parallel to one another. The one at the back being about 1 foot in hight, the front one about 9 inches; the distance apart being according to the length of the sash, which is usually 6 feet. These frames are always placed in a position naturally sheltered from the north-west, or else a high board fence is built to shelter them. The soil is pulverized and enriched in the best possible manner, and the lettuce is planted usually (here) about the first week in March, or nearly a month before operations can be begun in the open field. When the ordinary size of sash (3 x 6 feet) is used, about 50 lettuce plants are set under each sash, or 5 rows of 10 plants in each, as shown in figure 1. But when a double crop of lettuce and cauliflower is grown under the same sash, they are planted, as shown at figure 2, with three entire rows of lettuce, and three of the lettuce plants in the other two rows replaced by cauliflower, the cross (x) showing where the cauli-



1. SASH OF LETTUCE. 2 LETTUCE & CAULIFLOWER.

flower plants are placed. Thus planted, each sash contains 44 plants of lettuce, and 6 plants of cauliflower....Presuming that both are planted on March 1st, and protected in the usual way with sash, the lettuce will be fit for use, and cut out by about May 1st, leaving the whole space in the frame to be occupied by the six plants of cauliflower, which, at this season, protected by the glass, will now grow so rapidly that it will be necessary to add to the frames another board in hight, so as to give it head room. With proper attention to airing and watering, an excellent crop of cauliflowers is almost certain by the end of May, or about three weeks sooner than it would mature out-doors, if it matured at all; for all cultivators know how precarious a crop cauliflower is when planted in the open ground in our hot, dry June weather. In England the crop rarely fails, when planted in spring out-doors, for there they get very nearly the conditions of temperature which we give when forwarded under glass in the way above described.... The advantage of this double crop is apparent. Only six plants of lettuce are lost by the presence of the cauliflower, while three weeks longer use of the sash matures the cauliflower, which at that season readily sells in New York at from $6 to $9 per dozen, and by averaging the lettuce at $5 per 100, a moderate estimate for the double crop of lettuce and cauliflower per sash, would be $5. The variety of lettuce used is the Boston Market, and of cauliflower, the Early Erfurt. Though the new dwarf sort known as Snowball, will probably, with its compact growth and short leaves, do even better.

The Crossing of Lilies.

BY PROF. ASA GRAY.

Mr. Francis Parkman is famous as a horticulturist as well as a historian. In a new number of the "Bulletin of the Bussey Institution"—of which he was formerly Professor of Horticulture—he has now given the history of his "Hybridization of Lilies," carried on for ten or a dozen years. He began by crossing two superb Japanese Lilies, *L. speciosum* and *L. auratum*. The first year he failed; the second year brought one splendid success; for it gave us that superb lily, twelve and even fourteen inches from tip to tip of the extended petals, which, when sent to England, astonished the horticultural world, and which there received the name of Parkman's Lily (*Lilium Parkmanni*). The other results obtained in this and the succeeding operations, were of little or no practical value, but were as surprising as the Parkman Lily is magnificent.

We expect offspring to take after both parents, a hybrid to inherit somewhat equally the characters of the two species that compose it. That was the case with the Parkman Lily, which has the fragrance and form of *L. auratum*, and the brilliant color of the best races of *L. speciosum*. But this was the result in only one case out of more than fifty. Every other seed that germinated and lived to bloom, produced flowers exactly like those of the female parent, *L. speciosum*. But they were hybrids nevertheless. Mr. Parkman took all the necessary precaution to prevent access of own pollen; and the seedlings showed the blood of the male parent in their stems, though not in the blossom; for these were mottled in the manner characteristic of *L. auratum*. Though the male parent showed for so little in the first generation, there was reason to hope it might be impressed on the second. So Mr. Parkman fertilized several of these hybrids with the pollen of *L. auratum*, precisely as their female parent had been fertilized. The result was a very little seed set, but enough to produce 8 or 10 young bulbs. Of these, when they bloomed, one bore a flower combining the features of both parents. All the rest bore flowers not distinguishable from those of *L. speciosum*.

Was this invetrate habit of taking after the mother only, or mainly, a peculiarity of these two species, or was it a character of Lilies generally? To settle that question, Mr. Parkman crossed *L. umbellatum* with the pollen of *L. auratum*. The progeny was not to be distinguished from *L. auratum*, yet showed its hybridity in the imperfect condition of the stamens of many of the blossoms, and in the abortion of the pistil of some of them. Next he crossed *L. longiflorum* with the pollen of a deep red variety of *L. speciosum*. Seeds were abundantly formed; but the plants raised from them produced the flowers of the female parent, unchanged, the pure white being without tint or spot. Some of these he now crossed with *L. au-*

ratum, in some instances successfully; but in the offspring neither *L. speciosum*, their grandfather, nor *L. auratum*, their father, had produced any effect whatever on the pure white of their petals; yet the anthers had been affected, taking a chocolate tinge from the father; and as before many of the flowers were imperfect. Some of the best of these flowers were now tried in the third generation, with pollen both of *L. auratum* and *L. speciosum*; but not one would bear seed.

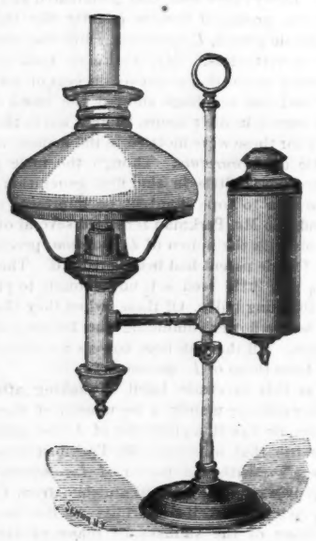
Moreover our American *Lilium superbum* was fertilized, under every precaution, with the pollen of six foreign species; seeds were abundantly produced in some instances, though in many the pods contained only chaff; several hundred bulbs were raised, but when these came to bloom, not a single flower of them all was distinguishable from that of the pure *L. superbum*. Nor in this case was there any mark of the male parent to be found in the stem, or leaves, or bulbs. All this is very curious indeed. We knew that offspring might take a great deal more after one parent than the other. But that the female sex should be so prepotent in Lilies, is a quite unexpected result. That in so many cases the influence of the male parent should be imperceptible is most wonderful.

THE HOUSEHOLD.

☞ *For other Household Items see "Basket" pages.*

Light in the Dwelling.

One need not be very old to recollect when kerosene, or some other product of petroleum, or coal, was first introduced. What a blessing it has been! Formerly one of the attractions of city or town life, was the ability to use gas, but now the humblest farm-house may be quite as brilliantly, and more pleasantly lighted than the most costly city dwelling. The blessing is so general, and so much a matter of course, that we hardly appreciate it, but let us put aside our lamps and use the tallow dips, or even the lard-oil lamps, or the "star," or other candles, for one evening, and we shall be very unwilling to return to them. Even the commonest kerosene lamps are a great improvement upon any mode of lighting that had gone before, and the great benefits of kerosene—which we use as a general term for the best illuminating oil—were to the farmers, and their families, rather than to those who lived in towns large enough to sustain gas works. With the brilliant light now at command, the evening is made much more valuable to the



CLEVELAND SAFETY LIBRARY LAMP.

farmer and his family. Aside from the general increase of cheerfulness which abundant light brings, reading and study can go on quite as well—in fact, better than in day time—for in the day, an active person feels that he should be out, and astir; the evening seems the proper time for study, and our present light is a great help. When we have a good thing we like to tell others of it, and seven years ago this month, we described and figured (Feb., 1871) the "German Student Lamp." We had been temporarily residing in the city, and though the house was supplied with gas, we used this lamp with kerosene in our study, as being in every respect, including cheapness, greatly superior to gas. The article was written after two or three years' use of the lamp in the country, and having that, we did not feel any inconvenience from the absence of gas. While the "German Student Lamp" seemed nearly perfect, there were some inconveniences attending it, especially in the device for raising and lowering the wick—which sometimes would work, and at other times would not. The mechanical arrangement for this purpose was crude and imperfect, and that was the only fault in a lamp that gave a light for study use, far superior to any gas-burner we ever met with. Recently we have been using the "Cleveland Safety Library Lamp," made by the "Cleveland (Ohio) Non-Explosive Lamp Company," and we can apply all our commendations of the "German Student Lamp" to this—and a little more besides. The difficulty we found with the other lamp—the management of the wick—has been completely removed in this. The mechanical arrangement for controlling the flame is perfect in its working, and the amount of light is easily and certainly adjusted. The lamp, of which an engraving is here given, has the same general appearance of the "German Student," but the oil reservoir is much larger, and less frequent filling is required. All the metal-work is nickel-plated, thus insuring an elegant appearance, and ease of keeping it in order. The "Cleveland Non-Explosive Lamp Company," who make this lamp, apply to the fount which holds the oil, as they do to all other lamps made by them, a safety guard of wire gauze, to prevent explosions in case unsafe oil is used. While it is well enough to have this, absolutely safe oil is now so easily to be procured that we can not advise the burning of any other in any lamp. If there is any lamp for burning kerosene that will give a more satisfactory light than this "Library Lamp," we should be very glad to make its acquaintance.

Home Topics.

BY FAITH ROCHESTER.

Putting Children to Bed.

Ten years ago an old friend told me that her babies had cried more over going to sleep at night, or taking their daily naps, than about all their other troubles put together. She said this after expressing surprise at the cheerful way in which my year-and-a-half-old boy went up stairs for a nap, and the quickness with which I returned to the parlor. Possibly she followed too strictly advice often given in print to mothers, something like this: "Have a regular hour for the child's nap, or for its bed time, and when that hour comes, put it in its little crib and leave it there to go to sleep without further attention." Bad advice, I think.

Being of a tender heart, my friend more likely rocked or soothed it to sleep herself, but the attempt to establish regularity may have been very trying to both mother and child. I came very near carrying this thing too far myself. Regular habits, for children of all growths, are an excellent thing in most respects, but their formation should be coaxed rather than forced, and many times "the play is not worth the candle."

I thought I must train my first baby to good and regular habits. It would be convenient for me, and wholesome for him, if he would go to bed for the night as early as six o'clock, and several times I labored with him two or three hours, in the vain endeavor to make a wide-awake baby go to sleep. A more experienced neighbor taught me better. She remarked, "Perhaps you never can teach that child to go to sleep alone in his crib. I would not try too hard."—"But," I said, "Mrs. Brown's baby goes to sleep in that way, and always has done so."—"All babies are not alike," she said smilingly, "as I have good reason to know."—She went on to tell me some of her own experience. She supposed that babies must be rocked to sleep, unless they went to sleep while nursing, until she happened once to lay her first child, six weeks old, upon the bed, just as she had put on its night-gown, being suddenly called away to wait upon a neighbor at the door. When she came back to the baby, to her astonishment and admiration, the little thing was fast asleep. Next night she put it in bed awake, and it fell asleep without resistence, and always thereafter did the same, never disturbed unless there was loud talking in the room. This was so charming, the mother thought she would have her next little daughter behave in the same way. But no amount of coaxing or perseverance could reconcile daughter number two to being put to bed awake.

Danger in Trying Too Hard.

Night after night the poor baby screamed and sobbed itself to sleep, almost breaking the heart of its loving and conscientious mother; at the end of a week of such agony, being no more inclined to yield than at first. Then the mother concluded that she had mistaken the path of duty, and gave up the contest, fearing a lasting injury to the darling's health from such excessive excitement.

"Did she conquer you?" I asked.—"I feared so at the time," replied the mother, "but there is not a more obedient child, or a better girl in the world than my Daisy."—I believed her. But, since then, our gentle, conscientious Daisy, in her early womanhood, has suffered from long and dangerous illness, followed by a period of distressing mental weakness and aberration, which was, I have no doubt, connected in the child's vital or nervous history with that week of protracted and severe mental excitement in her baby-hood. Other similar cases have come within my knowledge. We do not know how many of the brightest and best minds have suffered great injury from the conscientious endeavors of their own loving mothers, to train them up in the way they should go. I have heard of one baby who froze its hand one winter night, though it had previously screamed long and loud, because it was an inflexible rule of its parents, not to go near it after it was once tucked up warm for the night in its crib. Mrs. Stowe tells of a baby that pulled the pillow over its face and smothered itself to death, when crying itself to sleep alone.

Going to Bed when Sleepy.

I have had little difficulty with the bed-time business. The little ones go to bed when they get sleepy, and as there is usually an early breakfast to which they like to get up, they are sleepy early in the evening. The bed feels good to a sleepy child, unless mere sleepiness has degenerated into crossness. If a child is half sick as well as sleepy, it probably wants its mother's arms. If little ones are taken arbitrarily away from their playthings or pleasures because "it is bed-time," they learn to regard bed-time as a natural enemy. As a little one's bed-time draws near, the elder members of the family should be considerate, and not propose or introduce new amusements or pleasures, which it will be hard for the little ones to leave. If anything that would have interested the little one happens after it has gone to sleep, it ought not to be mentioned afterward in a way to make the child feel that it has lost something by going to bed early.

Last night, for a wonder, my youngest boy went to bed crying, because he wanted to sit up and see papa. He is seldom awake when his father comes from his work at about seven in the evening, and until quite lately he supposed that papa was only at home a little while in the morning. He was so sleepy he could not keep awake, and finally consented, with tears, to go to bed as usual—only usually he says after a yawn, putting his hand in mine, "I guess I had better go to bed now." I had only just kissed him and wiped away his tears, when I went to the door and saw "papa" coming. I stood there until he came in, and whispered to him to kiss the little one if he was awake enough to notice him, but not to wake him more with play or talk. Behold, the child was already asleep, and then I cautioned all not to tell the baby boy that his papa came as soon as he had gone to bed lest he should

insist still more upon sitting up another time. He has his reward for early retiring, as he is the only child always *sure* of eating a six o'clock breakfast with papa. However the others may lag behind, there he sits in his high chair and bib, holding animated discourse with one who is to his imagination the personification of all the virtues and graces desirable in man.

Cheap Living for Mary and John.

They did get married, it seems; and now Mary inquires of me, how they can economize in the dietetic department to the best advantage of health and general comfort, as well as purse. This Mary has so much natural good sense, that I would not venture to advise her, did I not believe that she will take my advice, or not, just as suits her own judgment. I do not positively know, but I suspect that her John will not be very hard to suit. He has not been greatly pampered in his childhood, and will not think it hardship to live without the dainties, which needlessly consume money and time, and health, in many families. He has not taken enough meals at the best hotels and high-priced restaurants, to give him a hankering for choice porter-house steak, with an expectation that his home cook can give him equally palatable beefsteak, skillfully prepared from any scrawny bit of beef, which he can find at the nearest butcher's shop. Economy is absolutely necessary for this young couple, for though John is, as he says, "chock full of day's works," having good health and energy, and industrious habits—we have come to such a pass in this fine and happy land, that many a man, who is willing and eager to work, seems forced to stand idle a part of the time. And then every one should prepare for rainy days ahead.

Meats, Costly and Cheap.

Speaking of meat—the best beefsteaks are extravagant for all but the wealthy. The seeming necessity for more or less beefsteak at breakfast, to give one strength for the duties of the day, is a result of habit. People suppose that it possesses uncommon strengthening power, because it acts so quickly upon the system. A bit of juicy beefsteak yields us nourishment already so nearly assimilated to our own flesh and blood, that we begin almost immediately to feel its help, but many—women and children especially—are over-stimulated by the meat they eat, and receive more harm than benefit from its use. This is a question for individual or family judgment; but when good meat is dear, we may be sure that it is not necessary to the health, if other good food be supplied. In selecting meat, it is by no means cheapest in the end, to "get the best," if this means that which is highest in price. The neck and brisket (breast or breast-piece next to the ribs) are low in price, but long cooking makes them tender and good. A common way now-a-days, and an excellent way, of boiling beef, so as to make it tender, and to save all the juices of the meat, is to "smother it down in the pot," or "roast it in the kettle." Pieces of the leg and shin are also cheap, and from these good soups can be made; and the soup-meat, cut into small bits, or hashed, with or without chopped potatoes, will make good breakfast dishes, warmed with a little butter, salt, and pepper. More than once, one ten-cent soup-bone has helped to make two or three meals at our house, and a fifteen-cent shin-bone has been worked into four meals for six of us—all of which I am not ashamed (as some would be) to confess. Why not brag of it?

Vegetables—Bread.

Vegetables are usually cheap, and good as food. The earliest in market are of course the dearest, but poor folks can wait a little, and enjoy their vegetables just as well, when they have become plenty, and consequently cheap. Potatoes are dear in a time of scarcity, and though I like to see them freely in the family, I do not consider them as necessary as some housekeepers do. *Bread* is, after all, the staff of life—the best and cheapest food in the end, provided it is *good* bread. It must be sweet with the natural sweetness of the grain, as well as light and tender. It must contain the bone-building and muscle-making, as well as fat-producing elements. Good meat (especially beef), good grain (especially wheat), and good milk, each give us all the elements required for the building up and repairing the waste of the human body, yet only milk will do for sole and steady diet, and that only for infants. A "generous diet" embraces a wide variety, and this some of us wish to get with as little expense as possible. We want something to eat with our bread. "Bread and *with it*," my friend's brother used to say, when in dry times she used to say, "What in the world shall I get for dinner." Concerning the "with it" part, I may write further another time.

Beef Smothered Down.

Two, three, or four hours before dinner, (according to the size of your piece of meat,) put the beef into boiling water, and keep it boiling gently until it is cooked very tender. By this time the water in the kettle should have all boiled away. Season with salt, (and pepper, if you choose,) when the water is mostly boiled away, and turn the meat about in the kettle frequently toward the last. If at any time more water must be added, let it be boiling water. A piece with much bone is not suitable for this method of boiling, as too much water is required to cover it.

Soup Bones.

Any good lean meat may be used for soup, for it is the juice of the meat that is the essential principle of meat soup. But bones contain gelatine, which is chiefly useful in giving body to the soup. Bones, also, contain actual nourishment, according to Dr. Smith, author of "Foods." Those best adapted to soup, are pieces of the leg and shin. They should be well washed, and subjected to a long, steady boiling. So far as the meat is concerned, it need not be boiled longer than until it is cooked tender, which may be in three hours; but the bones do not yield their best contribution to the soup without longer boiling—from six to eight hours, or all day if you like. As poor folks can not afford to give the soup-meat to the dogs and chickens, it is well enough to remove the meat from the kettle when it is done tender, without allowing it to yield all of its goodness to the soup. If you have all of the juice of the meat in the broth and the meat, you can use both as you see fit, without any waste. But if excellent soup is the main object, boil the meat with the bones until all are "in rags," and you can still use the meat. Of course soup-meat must be put into cold water, heated slowly, and boiled very gently, but steadily. I did not mean to tell now all about soup making.

A Neat and Useful Wood-Box.

BY JOS. L. TOWNSEND, PAYSON, U. T.

Wherever wood is burned, as it still is, at least in the kitchen, in many localities, a box of some kind, to hold the day's supply of fuel, is necessary. Of course a common rough box will answer the purpose, so far as to hold the wood, but if the box, while none the less useful, can be made ornamental also, two ends are gained. Mr. J. L. Townsend, of Utah, sends us very neat drawings of a wood-box of his contrivance, with the following description. "Materials required in construction are: about 30 ft. 1-inch white pine, 6 1¼-inch No. 8 screws, ½ lb. 6-penny nails, a few brads, and ½ lb. glue. Figure 1 shows an end view with center, from which the circle is drawn at *a*. Fig. 2 is a front view, from which the ornamental back can easily be reproduced, figures 1 and 2 both being one-sixteenth of the actual size. Figure 3 is a perspective view not drawn to scale. Size of box, outside measure, 26 in. long, 17 in. wide, 15 in. high in front, and 23 in. high behind to underside of shelf, *b*. Shelf is 28 in.

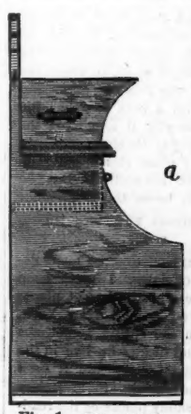


Fig. 1.—END VIEW.

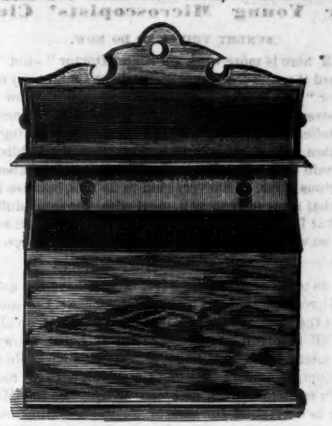


Fig. 2.—FRONT VIEW OF WOOD-BOX.

long, and 9 in. wide, moulded on ends and front edge, projecting 1 inch. Ornamental back is cut from a piece 27½ in. long, and 13½ in. wide. At *c*, figure 3, is shown a drawer, 4 in. deep on face,

Fig. 3.—PERSPECTIVE VIEW OF WOOD-BOX.

sliding under the shelf, *b*, on cleats fastened to the ends of box, inside. At *d* is a movable till or box, which rests in place on shelf *b*, and is secured from slipping off by pins fastened in the shelf, which enter corresponding holes in the ends of the till. Handles to drawer and till are turned from black-walnut, and fastened securely by screws from inside. The box is securely dove-tailed together, front and back, as high as shelf *b*. The ornamental back-piece is then fastened by dowels and glue in place. The shelf is then nailed on, nailing through the back into the edge of the shelf. The bottom of the box is then nailed on, and the drawer, constructed of the usual pattern, is fitted to its place, so as to slide in and out easily. The till is constructed the same as the drawer, except the front, which is made from ¼-inch clear, straight-grained pine, steamed, and nailed with ¾-inch brads, while hot, into its place. I designed and made one which we have now used for three years. It holds enough wood, filled morning and evening, to supply our "Charter Oak" cook stove. The movable till is very convenient to use in gathering chips, or as a receptacle for kindlings. It being as light and portable as a chip-basket, and never in the way. The drawer is used to hold a stove-brush, shovel, blacking, stove-hook, kindling-hatchet, kindling-saw, hearth-broom, etc., being a place for the stove utensils that are usually scattered under foot and out of place. Our wood box is very neatly painted and grained in oak, and combines more usefulness and ornament than any like piece of kitchen furniture in the market. The drawer is not in the way of putting in or taking out fuel, and the boys or men who keep the box supplied, should be taught to place the wood in quietly and regularly, and not to throw it into the box in a careless manner.

BOYS & GIRLS' COLUMNS.

Our Young Microscopists' Club.

SUNDRY THINGS TO DO NOW.

Well, here is more work for "The Doctor"—not that I regard it as "work" exactly, perhaps I might say more fun for "The Doctor." Those of you, and I know that it is several thousands already, who have the *American Agriculturist* Microscope, and have read the Working Description with it, must have noticed that the Publishers have said that "The Doctor" will tell you more about it in various ways. I am very glad to do this, because I am sure that some of you will meet with the same difficulties that I found when I first had a microscope, and I shall be very glad to help you over the hard places. So

OUR YOUNG MICROSCOPISTS' CLUB

consists of all of you who have, or can have the use of, the Microscope sent out by the Publishers. Let me tell you at the start, that this Microscope will not do all, or show all that you have read about as being shown by "the microscope." A "house" may be a log cabin with one room, or it may be a great mansion with 20 rooms, and in each case be a complete house. So this Microscope is very good for one of its kind, costing only a fraction of a dollar, while the one I most use cost $16, and the one that I use now and then, cost $50, and if one wishes, he can expend thousands on a microscope. So you see that when one speaks of a "microscope," it is a very indefinite term. The most generally useful microscopes, are not the very costly ones, and the way to begin to use a microscope at all, is to start with a simple and not costly one, and then when you can afford it, get a more powerful one. But my experience—and it has been a long one—has been, that however powerful a microscope one may have—and I have used some of the best that have been made—the little simple microscope, like the *American Agriculturist* Microscope, can not be put aside, as it has uses which the powerful ones can not serve. I am sure that you can learn much from this little instrument, and that it will afford you much interesting amusement for *the whole year*. Read what is said in the 14 column Description with each Microscope, and at once

MOUNT IT ON A BASE.

The directions there are very plain, and it will take but a few minutes to follow them. You will find that it will make the instrument much more useful and manageable. Then the next most useful thing to do, is to mount some needles as there directed, and to get up some kind of forceps, or tweezers, as there described. Having these and the Microscope mounted as there directed, you will be ready to examine anything that may come along. But one word about

OUR CLUB.

A club has two ends. I am willing to be one end—the handle or the "hitting end," just as you choose—but you youngsters, boys or girls, must be the other end, if you expect the "club" to prosper, you must take a part. Now, you, all of you, boys or girls, or if you like it better, young men and women, must help. How? By writing me what you find, the difficulties you meet with, in short, all about it. Many, no doubt, having read what the most costly microscopes will do, will try to see the same with this—they can't do it any more than they can hit a 1,000-yard target with a pistol. Others will want to know how to prepare things so that they can examine them; and others, still, having found interesting objects, will wish to know how to preserve them, so that they may show them to others, and keep them to look at again and again. So I say to all such, write and tell me all about it. How can I keep up a club all by myself? I shall expect help from all of you—and in turn I will try to help you—Isn't that fair?

WHAT TO LOOK AT.

As soon as spring opens you will find a great abundance of things that you will wish to examine, but just now cold weather puts a stop to animal and vegetable life. The Descriptive Sheet with each Microscope gives a number of things which you may examine with interest—such as flies, spiders, ants, taking separately their wings, legs, proboscis, etc.; fleas and lice on animals, small insects, including the minute lice on plants in the house, dust from the floor and elsewhere; soils, dried and fresh leaves, seeds, feathers, small fish scales, or bits of them, etc. I will give you a few more. One of the great uses of the Microscope will be in helping young people to study plants. Let me give you a starting point in this. Get a piece of one year's growth from any fast-growing tree, say a maple or a willow—any tree that makes strong shoots every year. A piece a few inches long will answer. Then go to the stack of corn-fodder, and get a *small* stem—no bigger than a lead-pencil is better than larger. Get the smallest stem you can find. Put both of these, the corn stalk and the twig, into warm water, and let them soak for some hours. Now I wish you to look at a *cross section* of these, that is, a slice cut across them, to see their *structure*, that is, how they are made up. To make sections of this kind, there are nice little instruments, which you can get for $5 or more—but we must do without such expensive things. Having your corn stalk well soaked, and something to cut with—a razor is best, but a very sharp, thin knife may do. Put the corn stalk on a piece of board, put the nail of your fore-finger as a guide, then cut straight down with the razor. This piece will probably be thick; move your nail back the least distance possible, and cut again; this time you may get a very thin slice, but by care, using the nail as a guide, you can soon get a slice as thin as the thinnest paper. It is well to keep the end of the corn-stalk wet, and when you get a nice thin slice, by means of a needle, put it on one of the glass slides of the Microscope. Then try the willow or maple. These are harder than the corn-stalk, and will require more care to get a *very thin* slice, still, with patience you can do it. Having a thin one, put it by the side of the corn-stalk slice, put the other slide over, and examine

BOTH THE TREE AND THE CORN STALK.

These must be looked at as *transparent objects*. Having both *sections*—as these are called—between the two glass slides, push the slides under the clips or springs of

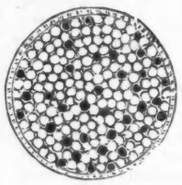


Fig. 1.

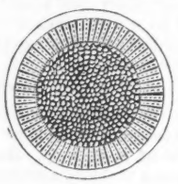


Fig. 2.

the Microscope, placing them so that the section of the corn stalk will be in the field of view—that is, directly under the lenses. Having adjusted the focus properly, so that you can see distinctly, the section of corn stalk will appear as in figure 1. Having looked at this carefully, move the slides so that the section of the tree twig is brought into view. Notice that this is quite different, and that it appears as in figure 2. Turn back again to the section of corn stalk, and section of tree, and get them well fixed in your mind. You see how different they are? What is the difference? In the corn stalk you have pith, with dots all through it. In the willow or maple, you have pith in the center, a ring of harder substance, and then a ring of bark. Here in these you have a ring of pith, a ring of woody matter, and a ring of bark. In the corn stalk you have pith, scattered through it dots that look like the woody matter of the tree, and no distinct bark. Now I wish you to look at these carefully, and to recollect distinctly how they look. When you have them well fixed in your mind, slip the sections off from the glasses upon a bit of stiff writing paper, and fold them up carefully, until I can tell you how to preserve them. You have now stems of the

Fig. 3.

TWO GREAT FORMS OF VEGETATION.

The corn stalk stem, in which woody fibre was distributed all through the pith without regular order, and the willow or maple stem, in which the woody fibre was in a ring all *around* the pith, with a bark outside. Remember this—for it is almost the *very beginning of the study of plants*. You can try other stems also, and learn to make thin sections. But you will want to be on the lookout for

AMUSING THINGS FOR THE MICROSCOPE,

and as we extend over so many degrees and climates, I must keep ahead of the season. In wet places we find, even around New York, very early in the spring, sometimes in March, and those who live in the Southern States, may find it even earlier — the curious Field Horse-tail. With me, it grows in wet sandy places by the roadside, and is one of the first signs of vegetation in spring. In most of the Northern and Middle States, you may look for it in March, if not earlier, and when you find it it will be like figure 3, and of about that size, looking very little like a plant, as it is of a light-brown color, with, at each joint of the stem, a sheath of a darker color. At the top of the stem is an oval head, as seen in the engraving. Later in the season this plant produces green stems—but we do not care about these at present—though we may say that from the pine-like appearance of these stems, the plant is called

GROUND PINE, AND FIELD HORSE-TAIL.

But the stems shown in the engraving are those which appear first, and are the most interesting, though from their strange shape and color they do not look much like plants. I think they must be very common—for I always see them in wet places, as I drive home from the depot, in early spring. If you find these, gather a lot, put them in a bottle, or tumbler, and let them dry. Then, if you wish to see something funny, shake from the heads of these plants some of the dust, which they will give out abundantly, upon one glass slide of your Microscope. It will appear like a ball, with four arms, as in figure 4. While you are looking at it, ask some one to breathe upon it, and you will see a very lively motion; the arms, as if ashamed of themselves, will at once coil around the central portion, and appear as in figure 5. If you wait until the moisture of the breath passes off, the arms will gradually spread out again. What does all this mean? you will ask. The little ball, with the four arms, is to this plant what seeds are to most other plants. This little ball can grow and make a new plant. You can see how the arms, so easily affected by moisture, can, by alternate drying and moistening, move the little seed-like ball to quite a distance. Usually I find a great quantity of this plant close at home, and if I find it abundant this spring, will lay in a lot for those who may want it. And this reminds me that out of our Microscopists' Club—there will somehow grow up

Fig. 4.

Fig. 5.

AN EXCHANGE CLUB.

Those who find interesting things, will wish to send them to others who have things which they want. Well, we shall see what will grow out of it. You may be sure of all possible help from

THE DOCTOR.

Aunt Sue's Chats.

MRS. T. DAVIS EVANS has been kind enough to send us a description of a home-made frame and corner-bracket. She begins her letter (dated Nov. 24th) with the remark: "As it is about time for Christmas presents, I will try to give you a few hints," etc. It is evident that she did not know (or has forgotten) that *six weeks must elapse* before my correspondents can receive any acknowledgement through the *American Agriculturist* of their communications. Consequently the Christmas presents for 1877 will be things of the past when this article appears; but things like this are not of necessity confined to Christmas presents, so her directions are given here, that those who wish may avail themselves of them now, and those who wish to make such presents for next Christmas, will find them on record. I may add that the material is called "corn husks" in the East, and "corn shucks" in the West and South. Each ear of corn is closely surrounded by leafy bodies, which overlap one another, the outer ones being harsh and thick, and often weather-stained, while the inner ones are soft and thin, and of a pleasing color. Mrs. E. says: "First I will describe a *shuck* picture-frame. Supposing the picture to be 8 by 10 inches, the materials needed are, some nice, white, pliable, inside corn shucks; two pieces of pasteboard (which may be cut from an old box), 12¼ inches long by 1¼ inch wide, and two pieces 10¼ inches long by 1¼ inch wide; a coarse needle and strong thread. First sew the pieces of pasteboard squarely at the corners (as in fig. 1).

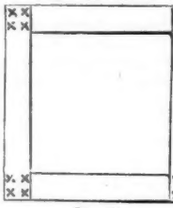


Fig. 1.

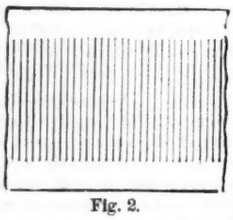


Fig. 2.

Second, cut a great many shucks about three inches long" (Mrs. E. does not say how wide, but I fancy they might be square.—A. S.), "and shred them as finely as possible (see fig. 2) with a large pin or needle (after a little practice you will find it very easy), leaving at each edge a margin of half an inch unshredded (as in fig. 2). When you have enough to begin with, fold them with the solid edges together (as in fig. 3)—crumpling the

solid part up in the fingers to give them a little fullness, and sew them all along the inner and outer edges of the frame (as in fig. 4), letting them project beyond the paste-board at least half an inch. For the next row cut pieces of the shuck about half an inch wide" (and two inches long?—A. S.), "and fold them into points (as in fig. 5), sewing them on so as to cover the stitches of the first row. (See fig. 6.) For the middle you can either put pieces like the outside rows, only running in the opposite direction (across, see fig. 6), or you can use the points, sewing them on diagonally. As you come to each corner, make a rosette of the shredded shucks, with a piece of solid shuck cut round and

Fig. 3.

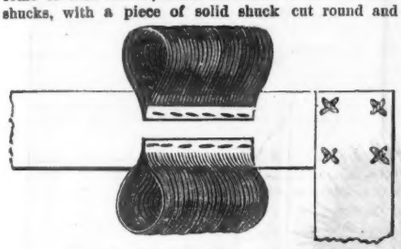


Fig. 4.—THE SHREDDED PIECES.

gathered to look like a button in the center, as a finish to the rosette. Remember that *neither the shredded pieces on the edges nor the points are to be mashed flat.*

"Now for the corner bracket. You need three pieces of thin board, cut in quarters of circles (see fig. 7), each piece a little larger than the last. Say the first is 8 inches from *A* to *C*, let the next be 9 inches, and the third piece 10 inches. Bore a hole in each corner for the cord to go through. Cut three pieces of cardboard like figure 8, just long enough to cover the curved side (from *B* to *C*) of the board. Cover it with shuck points. Cover the boards smoothly with nice paper. Tack the covered pasteboard (fig. 8) around the curved side of the board;

Fig. 5.—POINTS.

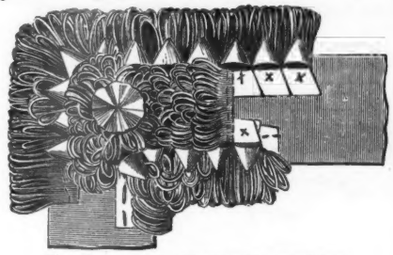


Fig. 6.—CORNER OF FRAME COMPLETE.

three tacks will be enough, one at each end and one in the middle. Then string the boards on the cord, one at a time, putting a knot in the cord with a little peg through it at the top and bottom of each hole (fig. 9), to keep it from tilting up at one corner and spilling all of the pretty things off. With a little ingenuity, a few collar-boxes, some nice shucks, and bits of silk and worsted, a great many pretty things can be made, such as match-boxes, hair-pin boxes, work-boxes, pin-cushions, jewelry boxes, wall-pockets, watch-cases, etc."....We are much obliged to Mrs. Evans for her instructions in making pretty articles from common materials, and shall be very glad of any other hints she may give us in the fancy-work line.

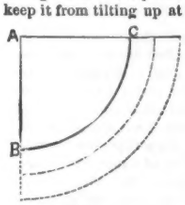


Fig. 7.

LEONIE B.—I know nothing about the process of dyeing straw-hats.. .I asked a cracker-baker "how to make crackers"; he looked compassionately at me and said it was impossible to make them without machinery. "Why?" I asked.—"Because the dough has to be so stiff that it cannot be manipulated with the hand."—"What are the ingredients used? Flour, water, and salt?"—"Yes, flour, water, and salt; but they cannot be made by hand."—"I suppose we could bang the dough with a cobble-stone rammer! couldn't we?"—"Oh! yes, certainly."—And that was the best I could do for you, Leonie. So suppose you make a very stiff dough of the ingredients mentioned, "manipulate" it with the potato-masher until you have "banged" it quite thin on your paste-board; then cut it into circles about as big as a small saucer; make indentations with a skewer all over them, and bake them; then let me know how they turn out.

Fig. 9.

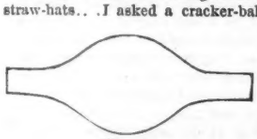


Fig. 8.

MARY E. STAM.—I know nothing about "allspice baskets," but suppose you string the spice upon wire, and weave them into whatever basket shape you choose. "Ethel" signifies "noble," and Ella (the diminutive for Eleanor) "all fruitful."

PHEBE-ANN.—You can make a very nice "bandoline" thus: Put a teaspoonful of Gum-Tragacanth into a tumblerful of water to soak; let it stand twenty-four hours, stirring it frequently, and see that it is all completely softened. Gum-Tragacanth is very unlike Gum-Arabic; that dissolves in water, while Tragacanth does not, but it takes up a great deal of water, swells enormously, and forms a thick mucilage. Add water to it, stirring thoroughly, until it is about like thick cream; then thin it with Cologne or lavender-water (the spirit of which will preserve it), until of the consistence for bandoline. [Perhaps every one may not know that Bandoline is the name of a French hair dressing, to stiffen the hair and make it stay in place. It is also made from quince seeds.—ED.]

J. T. F.—Yes, Fall River, Mass., has extensive factories, consuming nearly 140,000 bales of cotton annually, to make about 340,000,000 yards of goods, mostly prints.

Aunt Sue's Puzzle-Box.

As you will all be drawing around the table these cold evenings, I propose to give you another prize puzzle to try your wits and patience over, and to make you better acquainted with the dictionaries. The puzzle is constructed upon the same principle as that given in the April number of the *American Agriculturist*, 1877 (page 147); that is—I have given to each item of the enigma one of the synonyms or definitions given to it in the dictionary. Of course I have selected those that you would be least likely to think of. Which among you thought that—in the last prize enigma—"My 48, 11, 1, 45, 51, 34—chief," meant "*staple?*" The fact is, we use many words now-a-days, and never stop to consider their meanings. I propose to "stop" you for a minute or two over the accompanying prize enigma. I offer twelve prizes for the first twelve correct answers to it, subject to the conditions undermentioned, which are:—

1st. All answers must reach me on or before the last day of April (1878). 2nd. *Answers* must be signed with the *name* and *post-office address* of the sender, and be enclosed in a sealed envelope superscribed—"Answer to Prize Enigma." This must be put in another envelope, and addressed and mailed to "Aunt Sue, Box 111, P. O., Brooklyn, N. Y." On the first day of May, I will place all the answers received, in a box, and shake them up well. Then—as before—I shall invoke the aid of the little Clara Josephine, who, being then thirty months old, will not be accused of partiality; she shall preside over the box, and shall hand me the answers one at a time. I will open and examine each answer in the order of her selection, and to the first twelve correct answers will accord the prizes, one of which will be mailed, as before, to each winning address. The result will be publicly announced in the July number.

Each prize will consist of a pen and (nickel-plated) holder; the pen shutting into the holder when not in use, and filled with the coloring matter necessary to make ink by simply dipping the pen into water. All the members of one family may work out the solution together, but of course only one member of a family will send an answer. Now get out your dictionary and go to work.

THE PRIZE ENIGMA.

I am composed of 48 letters:
My 44, 9, 32, 2, 5, 18, 40, 48, is to throw out.
My 36, 10, 28, 24, 19, 6, is unbiased.
My 4, 26, 39, 43, 21, is inflated.
My 47, 30, 27, 12, 23, is vital.
My 29, 31, 42, 16, 34, is a charming person.
My 13, 33, 47, 46, 35, 19, is communicative.
My 33, 41, 3, 11, is a countryman,—a rustic.
My 1, 45, 20, 8, 15, is oscillation.
My 25, 22, 7, is a race, a family.
My 14, 17, 37, 5, is to rob.
My whole is a word meaning "shriveled," and part of its definition and application.

ACROSTIC.

1. A city of Holland. 2. A city of New York. 3. A city of Connecticnt. 4. A county of Maryland. 5. A town of New York. 6. One of the U. S. capitals. 7. A city of New Jersey. 8. A town of Pennsylvania. 9. A town of Maryland. 10. A city of New York. 11. A town of Iowa. 12. A town of North Carolina. The initials form a good old song. LITTLE ONE.

DIAMOND PUZZLE.

1. A vowel. 2. To weary. 3. To ensnare. 4. A city. 5. A profession. 6. Joy. 7. To direct. 8. A unit. 9. A consonant. The central letters, read downwards and across, form a profession. NIP.

ANIMALS ENIGMATICALLY EXPRESSED.

1. An engine of war. 2. Tardiness. 3. A small bag. 4. A weight. 5. A city officer. 6. Unfurnished.

FIGURE BLANKS.

Fill the following blanks with some number that will, either in spelling or sound, make sense of the sentence; as—for instance—"1000" in "*go* —— —— *ders and call Jim*," or—Go *thou San*ders and call Jim.

1. It was my mo —— —— ing my —— der limbs.
2. I — —— eaten any, I am —— tun —— in not feeling ill.
3. I never —— anything at —— up.
4. It would be well —— — ros —— use cam —— and qui ——.
5. I —— der how you —— so many.
6. —— veh was a gr —— city.
7. By —— do in adversity men of —— become —— —— n ——.
8. I recommend phy —— as a gr —— and thorough study —— —— ning the mind. JACK SPRATT.

CROSS-WORD.

My first is in scramble but not in push,
My next is in heather but not in bush,
My third is in satchel but not in bag,
My fourth is in horse but not in nag,
My fifth is in house but not in barn,
My sixth is in worsted but not in yarn,
My seventh is in shilling but not in penny,
My eighth is in few but not in many,
My ninth is in true but not in good,
My tenth is in fuel but not in wood.
If from these letters the right you take,
Some very good advice they'll make.

ANSWERS TO PUZZLES IN THE DECEMBER NUMBER.

NUMERICAL ENIGMAS.—1. Beware of reading without thinking of the subject. Up to December 18th, this enigma has been correctly answered by Willie P. Bricker, G. M. Taylor, Cyrene Griffis, H. M. Innis, Ellsworth W., Maxie Lane, Charles A. Seaver, Bethsinda, C. C. Averill, E. G. Spencer, Mrs. M. H. Dildine, L. M. Hull, W. C. Moore, J. H. Bird, and E. B. Brown.—2. The early bird gets the worm.

CROSS-WORD.—Household.

HALF-WORD SQUARE.

M A R T I N
A F O O T
R O S Y
T O Y
I T
N

DIAMOND PUZZLE.

C
P O T
M A R T S
C O R S I C A
S P I N E
I C Y
A

PI.—Too late I stayed, forgive the crime,
Unheeded flew the hours,
For noiseless falls the foot of time
That only treads on flowers.

ANAGRAMS.—1. Alternate. 2. Acrimony. 3. Presidential. 4. Lemonade. 5. Purchase. 6. Diameter. 7. Remainder. 8. Negotiate. 9. Remittances. 10. Geometrical.

BLANKS.—1. All, hall. 2. Row, grow. 3. Alter, halter. 4. Lass, glass. 5. Lad, glad. 6. Rove, grove. 7. Lime, clime. 8. Low, flow.

PUZZLE.—(This was—by some mishap—left incomplete by the printer.)

CONCEALED BIRDS.—1. Lark. 2. Wren. 3. Quail. 4. Dove. 5. Grouse. 6. Hen. 7. Swallow. 8. Heron. 9. Teal. 10. Owl.

Thanks for letters, puzzles, etc., to W. Simpers, Minnie Bennett, S. W. A. (M. D.), Isola, Mrs. P. B., Wilbur B. K., Jerry S. S., L. M. H., and Ellsworth W.

Send communications intended for Aunt Sue, to Box 111, *P. O., Brooklyn, N. Y.*, and *not* to 245 Broadway.

Chimneys and Chimney Sweepers.

We wonder how many youngsters would know the little fellow in the picture if he were not labeled the "Little Chimney Sweeper," and now that they know what he is, can tell much about him? In cities and large towns, when wood was burned altogether, soot, from the wood fires, would collect in the chimneys, and if this were not removed from time to time, it would catch on fire and burn furiously, and if this happened in a dry time, there was danger that the house, or other houses, might be burned. Those who make a trade of clearing out chimneys, are called "chimney sweepers," "chimney sweeps," and more frequently merely "sweeps." A "sweep" is now quite rare in New York, though once in a while we have seen one in the back streets, and looking as if he had not had a job in a very long time. Still, one need not be very old to recollect when the sweep's cry was one of the common street noises. They usually went in pairs, a man and a boy, and as they dressed in keeping with their trade, you may

THE LITTLE CHIMNEY SWEEPER. — *Engraved for the American Agriculturist.*

be sure that they were not very handsome to look at. They were generally colored people, but if white persons followed the business, they were so blackened with soot, that it was not easy to tell them from the black sweeps. Early in the morning the streets would ring with their cries. The fellows had strong voices, and they would sing rather than shout, "Sweep O. Sweep O. From the bottom to the top, sweep O-o-o-o.' But when the people in the cities gave up burning wood, and used coal instead, the trade of the sweeps was spoiled, and their song is now rarely heard—though it is now and then, as there are still a few old-fashioned people who prefer to burn wood—enough in a large city like New York, to give employment to here and there a sweep. The use of coal in place of wood for cooking and warming houses, was a great improvement—and a great blessing too, for if all burned wood now, as they did 50 years ago, it is difficult to see where enough wood could have been found, and it would now be a very costly article. The houses of our grand-parents were, at best, but poorly heated by wood fires, and coal not only brought an increase of comfort, but much labor of sawing, splitting, and bringing in wood, and keeping the fire in good order was saved. But the coming in of coal brought a greater blessing than either or all of these—at least to a few—it broke up the trade of the sweeps. You may think it was a blessing to stop them because they were so dirty and noisy, but that is not it. The trade was a bad one, sometimes a wicked one, in the abuse of little boys. Some machines were invented, which allowed the sweeping of chimneys to be done by men only, but most of the sweeps stuck to the old plan, and had a boy to climb up on the inside of the chimney, and scrape away the soot from its sides. How many of you boys from six to twelve years old would like such a life as that? Just think how dismal it must have been for these poor little fellows to climb up, at the risk of their lives, the long, black, dark chimney, with the soot filling the air and making it difficult to breathe! But before we say any more about our little friend, the sweep, let us say something about chimneys. You must know that people had fires in their homes long before they had chimneys. How very uncomfortable it must have been to have a fire in the middle of the room, and a hole in the ceiling above for the smoke to go out of, and the rain to come in at. Yet this was the way in which those who, 500 years ago, lived in the grand old castles, managed their fires. We read about the great wealth and splendor of the old barons, with hundreds of followers, but they did not live half so comfortably as the day laborer does now-a-days. The first chimneys were not made like ours; the stone walls of the big houses and castles were very thick, and a fire-place was made in the wall, with a passage in the wall for the smoke, which found its way to the open air through a hole in the side of the building. After a while chimneys, much such as we have now, were built. Where wood is burned, some of the matters that are formed in the burning *condense* on the sides of the chimney, that is, they cool and harden there, and this forms what is called *soot*, which in time would gather in such quantities as to check, if it did not stop the draft. Besides this, as already stated, the soot will burn, and a "chimney on fire," as it is called, is a dangerous affair in a dry time. There were two ways of getting rid of the soot, one was to burn it out; taking a wet day, when there was no danger of setting the roofs on fire. A lot of straw or shavings were put into the chimney and set on fire, and the soot burned out. Another way was to have the chimney swept. Chimneys at first were built very large, but as room became valuable, they were made smaller, and mostly the flues were so small that only a boy could work his way through them. For many years, in England, the homeless pauper boys were apprenticed to chimney sweepers, and it would be a sad story if the sufferings of these poor little creatures could be told. Living in dirt, and breathing soot, they were subject to peculiar diseases, and one known as the "chimney sweep's cancer," was very fatal. But let us be glad that the law has put a stop to this abuse, and that in England, at least, this wretched use of boys is no longer allowed. Hard, or anthracite, coal is used in all the towns and cities on the Atlantic coast; this makes no soot, but where the soft or bituminous coal is used, as it is west of the Alleghanies and in Europe, the chimneys get foul and must be swept. There is, however, no more need of employing boys to scrape the chimneys, as there are now contrivances by which the sweeping may be done without them.

[ADVERTISEMENTS.]

The gentlemen representing the New England Silver Plate Co., of New Haven, Conn., are reliable and trustworthy, and the readers of the *Agriculturist* will find themselves well rewarded for any money they may invest in their goods. They have two advertisements in this issue, one on this page and one on page 77, both of which are very readable and tasty.

IMPERIAL EGG FOOD.—This valuable article for making hens lay, is endorsed by the *Poultry World*, excellent authority, as being "by odds the best thing of its kind ever gotten up on either side of the ocean," while Geo. P. Burnham, the veteran poultry breeder and author says:

"Imperial Egg Food has wonderful properties in increasing the production of eggs."

One week's trial of it in your poultry yard, will convince the most incredulous of its value. See advertisement on page 76.

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PARENTS TRY THEM.

TEAS This is a combination of capitalists to supply *consumers only* throughout the *United States* with **PURE TEAS** at prices never before known, on the mutual principle, by getting up clubs. Send for New Price-List.

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TRY THE ORANGE COUNTY SEEDS.—See Advertisement on Page 70.

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At the solicitation of many of our friends, we this season publish our **Catalogue** of **Vegetable, Agricultural, Flower,** and **Tree Seeds,** together with **all the Novelties of the Season,** under one Cover, **free to all** on application by mail.

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FOR SALE.—4 y. St. pear, 5 to 7 ft., $20 per 100; 1 y. St. Pear, Root Grafted, 5 to 9 inch $35 per M, 10 to 24 inch. $45 per M. Catalogue Free. OWEGO NURSERY, Tioga Co., N. Y., HARVEY CURTIS.

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Durability being the point aimed at, the Boots are made as *pure* as possible, without regard to a highly finished surface, and the sulphurous appearance of the **"Candee"** Boot is evidence of its purity.

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THAN
ANIMAL MEAL,
Consisting of Bone and Meat of Animals, and Parched Grain, with so nearly all the moisture taken away as to be dry and odorless. Mix one part of this with six or eight parts of ordinary food. It is too concentrated to feed alone.
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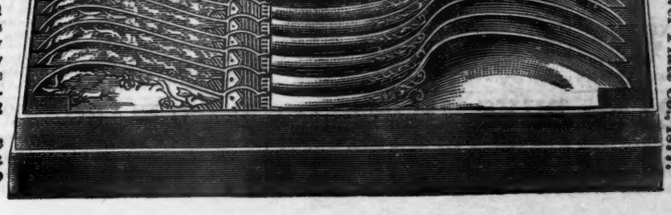
Finely and heavily plated with PURE NICKEL and COIN SILVER, on a new metal, called **Alfenide,** which is very similar to the finest English white steel. It contains **no** *brass* or *German silver* in its composition, and consequently *no poison,* or disagreeable taste. Are very strong and will wear for years. Two sets, $1.50.
We shall not furnish these goods to the trade, consequently they cannot be supplied by any other manufacturer or dealer. We also make of same quality, Table Spoons 6 for $1.75; Forks, 6 for $1.75; Table Knives, balanced, solid steel handle and blade, triple plate, 6 for $2. **New England Silver Plate Co.,** Man'f'rs, **New Haven, Ct.**



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$250 IN PREMIUMS

$250 IN PREMIUMS

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CHAMPLAIN.—A bearded variety—a cross between the Black Sea and Golden Drop—combining the remarkable hardiness of the former, with the superior quality of the latter. Its strong and vigorous straw, growing 6 to 12 inches higher than its parent varieties, stands erect, frequently bearing even in very ordinary culture heads from 5 to 6 inches in length, containing from 60 to 75 kernels each.

Price, $1.00 per lb.; 3 lbs. $2.50, by mail, post-paid.

DEFIANCE.—Another variety of Spring Wheat of the highest promise, of which the above cut is a fair representation, the result of a series of experiments, to incorporate superior qualities upon the hardy stock of our common Club Wheat, by hybridizing it with one of the finest, whitest, and most extensively grown sorts of the Pacific Coast.

This variety displays great productiveness, vigor, and hardiness. It is a beardless, white chaff wheat, with heads frequently 5 to 6 inches long, very closely set with large white kernels, frequently numbering 75 to 80 to the single head.

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In order to induce Wheat Growers to give these new sorts a thorough and universal trial, we offer **$250 in premiums** for the largest quantities grown from 1 pound of seed, also for the 20 largest heads. For particulars see Circular.

TWO NEW VARIETIES OF POTATOES.

BLISS' TRIUMPH.

An extra early variety, ripening a week to ten days earlier than the Early Rose—and one of the most attractive in appearance of any we have ever offered. Superior quality and very productive.

TROPHY.

A new and exceedingly fair, medium early, red-skinned variety, resembling the Snowflake in appearance and quality. It might with propriety be called a Red-Skin Snowflake. This variety was exhibited in London at the great International Potato Show, in October last, and received a first-class certificate.

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BLISS' AMERICAN WONDER.

A cross between the Champion of England and Little Gem—combining the good qualities of both varieties, but is earlier and more productive.

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A careful trial of this variety the past season proved it to be ten days earlier than the ordinary variety. 25 cts. per packet.

EARLIEST TOMATOES KNOWN,

BLISS' LITTLE GEM.

Numerous testimonials received from those who tested this variety the past season, pronounce it two to three weeks earlier than any other variety. At the great Tomato Trial in London, at the Horticultural Society's gardens, it was the earliest of 60 varieties on trial, and received a first-class certificate. 15 cts. per packet.

ACME.

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The full Descriptions and Illustrations of the Premiums, with various Notes and Explanations, were published in 8 extra pages of our October number, which can not be repeated for want of space. Any one not having that number, can have one mailed, post-paid, for 10 cents; or a Premium Sheet only, will be mailed to any address without charge.

PREMIUM Explanatory Notes. N. B.

Read and carefully Note the following Items: The Table herewith tells the *name* and *cash price* of each article, and (in last column but one), gives the number of names sent in at the regular price of $1.60 a year that will secure any premium article. (The last column gives the number of names at the lowest club price for 20 or more names, that is $1.10 each, but only a part of the premiums come under this head. Some persons quickly raise large clubs by taking all the names at $1.10 each, and themselves pay the difference, 50 cents each, and even thus get the premium articles very cheaply.)....(*a*) All subscribers sent by one person count, though from several different Post-offices. But....(*b*) Tell us with each name or list of names sent, that it is for a premium....(*c*) *Send the names as fast as obtained*, that the subscribers may begin to receive the paper at once. Any one can have any time desired, up to next July, to complete any list, but every premium desired will be sent as soon as earned and ordered....(*d*) Send the exact money with each list of names, so that there may be no confusion of money accounts....(*e*) Old and new subscribers all count in premium clubs, but a portion at least should be *new* names; it is partly to get these that we offer premiums to canvassers....(*f*) One or two Specimen Numbers, etc., will be supplied free, as *needed* by canvassers, (when 3 cents per copy is furnished to pre-pay postage), but they are expensive, and should be used carefully and economically, and where they will *tell*. Other specimen numbers will be sent, post-paid, *to canvassers only*, for 10 cents each. The price to others is 15 cents....(*g*) Remit money in Checks on New York Banks or Bankers, payable to order of Orange Judd Company, or send Post-office Money Orders. If neither of these is obtainable, Register Money Letters, affixing stamps both for the postage and registry; put in the money and seal the letter in the presence of the Post-master, and take his receipt for it. Money sent in any of the above ways is at *our* risk; otherwise it is not.

☞ Premium Articles for Sale.

It often happens that persons, who have not time to secure these valuable and useful premium articles by raising clubs of subscribers, are desirous of purchasing one or more of them, and wish us to procure or select them. For the accommodation of such, *we will supply and send most of these premiums for cash*, at the prices in the Descriptive List, and prepaid or otherwise, as stated.

Table of Premiums

For Subscribers to American Agriculturist.

[In the following table is given the price of each article, and the number of subscribers required to get it *free*, at the regular rates of $1.60 a year, and also (with a part of the premiums), at the club rates of $1.10 a year, postage included, which is prepaid in all cases *by the Publishers*.]

TABLE of Premiums and Terms For Volume 37—(1878). Open to All—No Competition.

No.	Names of Premium Articles.	Price of Premiums.	Number of Subscribers required at $1.60	Number of Subscribers required at $1.10
1	*Tea Set* (Middletown Plate Co.)	$50 00	66	....
2	*Ice Pitcher* (do. do. do.)	$18 00	20	180
3	*Cake Basket*.. (do. do. do.)	$ 7 50	16	68
4	*Cake Basket*..(do. do. do.)	$10 00	18	100
5	*Casters*.... (do. do. do.)	$ 5 25	13	55
6	*Casters*.... (do. do. do.)	$ 7 50	16	68
7	*Casters*.... (do. do. do.)	$10 50	19	120
8	*Butter Cooler* (do.. do. do.)	$ 6 50	15	60
9	*Pickle Jar and Fork*. (do.)	$ 5 00	12	50
10	*Syrup Cup with plate*. (do.)	$ 6 25	15	60
11	*Child's Cup* (do.)	$ 3 50	8	35
12	*Twelve Teaspoons* (Meriden Cutlery Co.)	$7 25	16	63
13	*One Dozen Tablespoons* (do. do.)	$14 50	22	147
14	*One Dozen Table Forks* (do. do.)	$14 50	22	147
15	*Ladies' Folding Pocket Scissors*, (do.)	$ 1 50	4	....
16	*Child's Knife, Fork & Spoon*...(do.)	$ 3 00	8	30
17	*French Cook's Knife, Fork, & Steel* (do.	$ 3 75	9	37
18	*Case of Scissors* (U.S. Steel Shear Co.)	$ 4 00	10	40
19	*Portable Writing Desk*, (C. W. F. Dare)	$ 1 75	4	....
20	*Walnut Work Box*, (do.)	$ 1 25	4	....
21	*Buck-Saw for Boys*, (do.)	$ .50	2	....
22	*Little Girl's Wash Set*, (do.)	$ 1 00	3	....
23	*Sled*, (do.)	$ 2 00	5	20
24	*Spring Horse*, (do.)	$11 00	18	110
25	*Boy's Wagon* (C. W. F. Dare)	$ 5 00	12	50
26	*Boy's Tool Chest*, (E. I. Horsman)	$ 1 00	3	....
27	*Boy's Larger Tool Chest* (do.)	$ 2 50	7	25
28	*Boy's Larger Tool Chest* (do.)	$ 5 00	12	50
29	*Pat. Magic Bellhead Pencil* (Ludden & Taylor)	$ 1 50	4	....
30	*Ladies' Magic Charm Pencil* (do. do.)	$ 2 00	5	20
31	*Gents' Magic Charm Pencil* (do. do.)	$ 2 75	7	27
32	*Gold Pen, Telescopic Case* (do. do.)	$ 2 50	7	25
33	*Gold Pen and Pencil, Elegant* (do. do.)	$ 5 50	13	55
34	*Knives and Forks* (Patterson Bros.)	$14 75	22	147
35	*Knives and Forks* (do. do.)	$18 50	28	185
36	*Carver and Fork* (do. do.)	$ 3 75	9	37
37	*Pocket Knife* (Meriden Cutlery Co.)	$ 1 50	4	....
38	*Pocket Knife* (do. do.)	$ 2 00	5	20
39	*Pocket Knife* (do. do.)	$ 2 75	7	27
40	*Ladies' Pocket Knife* (do. do.)	$ 2 00	5	20
41	*Multum in Parvo Knife* (do. do.)	$ 3 50	8	35
42	*Crandall's "John Gilpin"*	$ 1 00	3	....
43	*Crandall's "District School"*	$ 1 00	3	....
44	*Crandall's Masquerade Blocks*	$ .75	3	....
45	*Crandall's "Acrobats"*	$ 1 00	3	....
46	*Crandall's Building Blocks*	$ 1 50	4	....
47	*Crandall's "Menagerie"*	$ 2 00	5	20
48	*Pair of Skates* (Patterson Bros.)	$ 3 50	8	35
49	*Boudoir Clock* (S. B. Jerome & Co.)	$ 3 50	8	35
50	*Wire Bed Mattress* (H. Buckingham)	$12 00	19	120
51	*Houchin's Patent Pocket Cook Stove*	$ 1 25	4	....
52	*Household Press*, (W. A. Boardman)	$2 00	5	20
53	*Aquapult*, (Force Pump), (W. & B. Douglas, Middletown, Conn.)	$ 9 00	17	90
54	*Self-adjusting Gold-plate Watch Key*, (J. S. Birch.)	$ 1 00	3	....
55	*Pocket Tool Holder* (Miller's Falls Co.)	$ 1 00	3	....
56	*Piano, Splendid 7-oct.* (Steinway & Son's)	$650 00	625	....
57	*W. S. Blunt's "Universal Force Pump"*	$12 00	19	120
58	*Silver Watch* (American Watch Co.)	$50 00	44	....
59	*Bracket Saw* (Millers' Falls Man'f'g Co.)	$ 1 25	4	....
60	*Payson's Indelible Ink—Pen, etc*....	75	3	....
61	*Excelsior Pocket Microscope* (Bausch & Lomb Optical Co.)	$ 2 75	7	27
62	*Abbott Pocket Microscope* (L. G. Abbott)	$ 1 50	4	....
63	*Cahoon's Broadcast Seed-sower*	$ 5 00	12	50
64	*Moore's Floral Set* (Moore Man'f'g Co)	$ 1 00	3	....
65	*Garden Seeds & Flower Bulbs* (select'n)	$ 2 00	5	20
66	*Planet Jr. Combined Drill & Hoe* (S. L. Allen & Co.)	$12 00	19	120
67	*Breech-loading Pocket Rifle* (Stevens)	$16 00	24	160
68	*Double Barreled Breech-loading Gun*	$50 00	66	....
69	*Shot-Gun* (E. Remington & Sons)	$ 6 00	14	60
70	*Shot Gun, breech-loader*, (do. do.)	$38 00	96	....
71	*Creedmoor Long Range Rifle No. 1* (do.)	$100 00	110	....
72	*Creedmoor Long Range Rifle No. 2* (do)	$85 00	100	....
73	*Creedmoor Long Range Rifle No. 3* (do)	$60 00	76	....
74	*Hunting & Target Rifle* (Remington)	$22 00	34	....
75	*Vest Pocket Pistol* (Remington)	$ 3 75	9	37
76	*Revolver* (Remington)	$ 9 00	17	90
77	*Turn-table Apple Parer* (Goodell Co.)	$ 1 00	3	....
78	*Climax Apple Corer & Slicer* (do.)	$ 1 00	3	....
79	*Family Cherry Stoner* (do.)	$ 1 00	3	....
80	*Bay State Apple Parer & Slicer* (do.)	$ 1 50	4	....
81	*"Saratoga" Potato Peeler & Slicer* (do.	$ 1 00	3	....
82	*Sewing Machine* (Remington)	$50 00	66	....
83	*Family Scales* (Fairbanks & Co.)	$14 00	21	140
84	*Clothes Wringer* (Best—Universal)	$ 8 00	16	80
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93	*Any Two Back Volumes do.*	$ 4 60	....	46
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99	*A $15 Library* do.	$15 00	24	....
100	*A $20 Library* do.	$20 00	31	....
101	*A $25 Library* do.	$25 00	38	....
102	*A Choice of Good Books.* (See Description, p. 408.)			

☞ *Every Premium article is* **new** *and of the very* **best** *manufacture. No charge is made for packing or boxing any article in our Premium List. The Premiums,* **Nos. 15, 18, 29 to 33, 37 to 41, 49, 51, 54, 55, 59 to 62, 65, 75, 76, 86 to 102,** *inclusive, will each be delivered* **FREE** *of all charges, by mail or express (at the Post-office or express office nearest the recipient) to any place in the United States or Territories.—The other articles cost the recipient only the freight after leaving the manufactory of each, by any conveyance desired.* **Illustrated** *and* **Descriptive List** *sent free to applicants.*

containing a great variety of Items, including many good Hints and Suggestions which we throw into smaller type and condensed form, for want of space elsewhere.

Continued from p. 49.

Doubling the Crop of Strawberries.—"A. C." has seen it stated "that ¼ lb. nitre, and ¼ lb. ammonia dissolved in ¼ hogshead of water, and sprinkled on the strawberries, will double the crop," and asks how much truth there is in the above. We suppose that the liquid is to be sprinkled over the vines rather than the berries, but in either case it would be of no use, as to be of any service the application should be made to the soil. Nitre (nitrate of potash or saltpetre) and ammonia, either or both, are good fertilizers for the strawberry, but we get any good results that may be expected from these, by the use of guano, or guano and ashes, both being excellent fertilizers for the strawberry. The reason A. C. has not seen ammonia (pure or uncombined) offered as a fertilizer, is because it is properly a gas, and can only be kept in a manageable state when dissolved in water, as the Water of Ammonia, or Spirits of Hartshorn. It is most conveniently applied in the form of the sulphate, and Sulphate of Ammonia is a regular article of trade with the dealers in fertilizers.

Gate to Prevent a Back Flow of Water.—"C. G.," Dardanells, Arkansas. To prevent the reflux of water from a river into a creek during high water, it will be necessary to embank the creek for a sufficient hight, and to put in a self-acting gate, that will open only outwards to let the creek water out. When the river rises, the pressure of the back water will close the gate, and keep it shut until the low level is restored.

Stables for 75 Sheep.—"J. B. S.," Johnstown, Pa. In the *American Agriculturist* for Aug., 1874, we gave illustrations and descriptions of a sheep barn, which would accommodate 75 or more sheep. This number can be procured for 15 cents. Several plans for sheep sheds or barns are given in Stewart's "Shepherds' Manual," price $1.50.

Mr. Vick, Please Stop Growling!—James Vick—perhaps our readers may have heard of him—sells seeds and things in Rochester, N. Y. He has a grievance. Foreigners can send their seeds through Uncle Sam's mails for *four cents* a pound, while Americans have to pay SIXTEEN CENTS a pound. Vick, it serves you right, you shouldn't be an American. Why don't you be as cute as the Detroit dealers? All they have to do is to run their stuff across the river to Windsor, and they can avail themselves of superior mail advantages just as well as if they were foreigners. We should think that a man of your enterprise would run a steamer from Charlotte, (we think that is the name of that very sandy and white-fishy place close by you on the lake), over to the other side, where no discriminations are made against a man just because he happens to be a citizen of the United States. Vick, please don't be unreasonable. What's a paltry twelve cents a pound, on the few dozen of tons you send out annually, compared with being able to sing "My Country 'Tis of Thee."

The Atlantic Monthly.—Each of the several monthly magazines has its peculiar features, which make it acceptable to its circle of readers. To say that the "Atlantic" caters to the taste of the most highly cultivated portion of the community is to repeat what every one knows. Its monthly issues are always fresh, with articles that live beyond the month, and its list of contributors includes well nigh all the names of our best writers. The prospectus for 1878 is very attractive in the names of those who are to contribute to the volume, but the publishers need only to say that the Monthly will be kept up to its own high standard, and its readers will be content. The publishers of the "Atlantic," H. O. Houghton & Co., Boston, have issued superb life-size portraits of the poets Bryant, Longfellow, and (recently) Whittier, either of which is sent for a dollar added to the subscription price.

Composting Muck with Ashes.—"A. L. W.," Kittery, Me. Twenty-five cents is too much to pay for leached ashes. They should not be worth more than half that amount in any part of Maine. Freshly burned lime at 10 cents a bushel would be preferable for the purpose. Two bushels of lime to a cord of muck would make a good compost. The lime should be air slacked and fine before it is mixed with the muck.

Herding Cattle for Fun.—"E. R. H.," Huntington Co., Pa. It is a great mistake to suppose that there is any fun in herding cattle on the Plains. On the contrary, it is one of the hardest and most dangerous of employments. Stockmen there do not want to hire inexperienced men, simply to give them opportunities for horse riding or sight seeing. To get employment on a cattle ranch, a man needs experience which has been gained through work and exposure that would kill a dozen young men who have lived in a city, and fancy they would find pleasure in the occupation. If there is any pleasant share in the business, it is that of the owners who have invested large sums in it, and can afford to take things easy while their hired men do the work.

Good Eyes and Steady Nerves are those of E. Eastman, of North Haverhill, N. H., who, in sending for the *American Agriculturist*, at the age of 75, does it in penmanship that is really beautiful. Besides this, he sends a specimen of what he can do if he tries. Within the space of ¼ an inch long, and ⅜ wide, he writes the Lord's Prayer, and without the aid of glasses; though it can not easily be read without a magnifier. A wonderful performance at any age, but at 75, it is astonishing. Mr. E. attributes this extraordinary preservation of his faculties to abstinence, during a life passed in agricultural pursuits, from strong drinks and tobacco.

"St. Nicholas," an illustrated magazine for girls and boys. It is edited by Mrs. Mary Mapes Dodge, and published monthly by Scribner & Co., N. Y., and when we say that there is not in the whole world anything of its kind that can touch it with a 10 (thousand) foot pole, it may be inferred that we think "St. Nicholas" will do. Mrs. Dodge is to be congratulated on having such publishers, and the publishers should rejoice that they have such an editor.

Subjects for Discussion at a Farmers' Club.—The following list includes the subjects to be brought up for discussion at the meetings of the Concord (Mass.) Farmers' Club, viz.: "What have we farmers learned the past year?....History, Culture, and Uses of Indian Corn....Production and Application of Manure. ....Can we Afford to Raise Our Stock?....Root Crops. ....How Farming Pays Best....How Shall we best Utilize our Hay?....Value of Experiment Stations....Cross Fertilization....Systems of Cultivation and Production. ... Insects Injurious to Vegetation....Are our Seasons becoming Dryer?....Supply and Demand....Healthy Houses....Exhaustion of the Soil....Poultry Breeding. ....In and in Breeding...Opportunities for Young Farmers"....This list may be useful to other clubs, both in suggesting a choice of subjects, and as an example of some questions which can hardly be profitably discussed, being insolvable and only resulting in irreconcilable differences of opinion at the best.

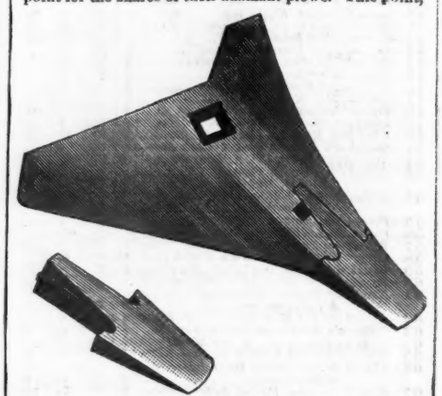
Proposed Amendment of the Patent Laws.—A bill has been introduced into Congress for the protection of farmers against suits for the involuntary infringement of patent rights, by the use of machines, implements, or articles which are claimed to be illegally made or sold. It provides that no suit can be enforced against an innocent purchaser, nor unless it can be shown that the purchaser was aware of the infringement at the time of the purchase. This is a very important and much needed measure, in view of the innumerable conflicting claims as to the patent rights on churns, gates, fences, barbed fences, lightning-rods, and the scores of other things which are peddled all over the country by seductive and irrepressible agents, who sell something only to be followed by another sharper, claiming a fee for the use of what the first man sold.

The "Gardener's Monthly."—The Variegated Grape.—With the December number, our able horticultural cotemporary closes its 19th volume. In these 19 years it has seen a number of other journals retire from the field; notably "The Horticulturist," founded by A. J. Downing, which fell into hands that so starved it that it was almost too weak from inanition to stand up and be swallowed by the "Gardener's Monthly." Then there was a Boston journal—we have quite forgotten its name—that started out, ignoring all things that were, or had been, in horticulture, and looked with contempt upon the slow-going "Gardener's Monthly." The most highly inflated balloon, if let alone, will, by a well known law of endosmosis, gradually diffuse its gas, and collapse. This is what happened to the Boston journal. We are glad to see that the "Gardener's Monthly" closes its volume with many signs of prosperity, among which we count an excellent colored plate of the Variegated Grape. *Vitis heterophylla*, which, under various names, including *Vitis variegata*, *Vitis humulifolia*, *Ampelopsis tricolor*, *Cissus quinquefolia variegata*, and others, has been in our nurseries for several years. It does not seem to have become so generally known as its merits deserve. Its handsomely lobed leaves are abundantly splashed and blotched with light green and white; the stems of the young growth, leaf-stalks, and stalks of the fruit-clusters, are light crimson, and the abundant berries, about the size of peas, take on in autumn the richest of blues. The plant is seen at its best in a partially shaded place, as in full sun its variegations are less marked. It may be used to cover a trellis, or if grown to a stake, it will form an irregular mass of great beauty, especially when in fruit.

Prize Essay on Diseases of Swine.—The American Berkshire Association has issued in pamphlet form the $100 prize essay on diseases of swine. This essay, with 500 pages, containing 1,600 pedigrees of swine, are given in the second volume of the Berkshire Record. The price of this volume is $5. The essay by itself is sold for twenty-five cents. The Secretary of the Association is P. M. Springer, Springfield, Ill.

To Destroy Dewberries.—"Geo. G. P." W. Sulphur Springs, W. Va. It is a difficult matter to destroy the variety of creeping blackberry known as dewberries. Every piece of root left in the ground will make a new plant. We once freed a field from this pest by deep plowing, so as to turn up all the roots and then thorough harrowing and cultivating to tear them out of the ground. The roots were then gathered and burned. The ground was planted to corn, cultivated flat, and sown to clover at the last working of the corn. No dewberries appeared after that. Lime and manure only affect them by encouraging the growth of the crop which smother them out. Sheep will consume them, when there is nothing else to eat.

A Great Improvement in Plows.—If we could prevent the points of our plow-shares from wearing out, it would be a very great economy in preserving the shares. The New York Plow Company has adapted a new device of a movable and reversible slip point for the shares of their adamant plows. This point,



when worn on the under side, is taken out and reversed; and when worn out a new one is put in; thus the share will wear a very long time without needing to be replaced. The engraving here given shows the form of the slip-point and share. The point is keyed on with a piece of 10-penny nail. The improvement, although quite new, has already taken prizes at the New York State, and Queens Co., (N. Y.), and New Jersey State Fairs.

A Plan to Find the Seat of Inflammation.—"Farmer," recommends persons who have horses that are suffering from inflammation in the joints or muscles, to apply cold water to the suspected parts; the seat of the trouble will be found where the moisture dries off the most quickly.

Baling Manure.—"H. T. R.," Montgomery Co., Pa. We can not give you the present address of the patentee of the process for baling manure. We suppose, from the fact that we see no notices of this process made public, that the patentee has no desire to give any information respecting it.

Size of House for Fifty Hens.—"F. H. C.," Freeport, Me. A house 10 feet wide, 15 feet long, and 8 feet high, is large enough for fifty hens.

The Shorthorn Convention.—At the Shorthorn Convention, held at Lexington, Ky., Oct. 31st, the most noteworthy proceedings was a report by a vote of 30 to 9 to admit native bred animals having six crosses. Others that trace back to imported sires and dams are admissible with six crosses; a resolution to the effect that color in this breed is immaterial, and that the popular desire for red animals is injurious to the Shorthorn interest; also, the recommendation that animals desired to be milkers should be bred early, while beef cattle should be matured before being bred. An evident impression prevailed that the milking capacity of Shorthorn cows should be encouraged.

Grass for Wet Meadow and Timber land.—"A. B. T.," Nora Springs, Iowa. Timothy and red top mixed at the rate of a peck of the first and a bushel of the latter per acre, would do well upon a moist drained meadow. Orchard grass and Kentucky blue grass, a bushel of each per acre, would be the best for open timber land.

How to Use Bones as a Fertilizer.—"L. R. S.," Bridgewater, N. Y. The easiest manner of preparing bones for use, is to burn them with wood. The phosphate of lime is all in the ashes, but the nitrogen is lost, as the animal matter is burned away. But an equivalent of ammonia could be purchased in the shape of dried blood, meat, or fish guano, for less money than it would cost to reduce the bones to a fine powder in their raw condition. 100 pounds of dry bones contain 45 pounds of gelatine, in which there are about 5 pounds of ammonia. This could be replaced by 20 pounds of sulphate of ammonia, at a cost of 5½ cents per lb., or $1.10. As the sulphate is at once available, while the ammonia of bones is only slowly produced, half or a fourth of the former would supply an equivalent of the bones.

City Manure or Artificial Fertilizer.—"J. C. L.," Philadelphia. We would rather use some good artificial fertilizer, such as Peruvian guano, or any of the prepared special manures, than city manure at a dollar a cartload. 100 lbs. guano per acre in autumn, would be very effective, and if repeated in the spring, would be of more use, than the same value in city manure, were it of better quality, than it usually is.

Renting Farms.—"Homestead," Indiana. We certainly advocate the renting of farms by young men, who have not sufficient capital to purchase land. The ownership of land is by no means necessary to success in farming; on the contrary, there are thousands of farmers who would be better off if they had some money in their possession to stock a rented farm, rather than own some land which they have not means to cultivate. Money invested in land is well called *real* estate, because there is no possession surer than a piece of land that is paid for. But as a compensation for perfect security, the interest derived from an investment should be low. No farmer can, or should, afford to pay more than four per cent on the value of land, as rental. Interest has been, and is, too high for the farmer's profit. If farms can be rented for this rate, it would pay many now owning land to rent instead. Money used in fluctuating business, such as the cultivation of land, ought to pay from 10 to 20 per cent. Every good farmer should be able to make that profit from his working capital; that is, live stock, tools, seed, and fertilizers. Therefore, one who rents his land, provided he has a long and secure lease at a reasonable rate, should make more money in proportion to his capital, than he who owns his land. Every farmer *should*, if he can, own his own farm, and have sufficient capital to work it; but as this is impossible, then let those who cannot do both, rent farms and use sufficient capital to work them thoroughly and profitably.

Packing Eggs in Salt.—"D. H. S.," Landisburg, Pa. Eggs can not be kept very long when packed in salt. The preserving process must necessarily render the shells impervious to air, else the eggs gradually decay. There is no better preservative than linseed oil smeared over the shells, or immersing them in milk of lime, which has been described so frequently.

Questions about Eggs and Fowls.—"A. G. O. M.," Manitoba. We do not believe half the reports current about extraordinary production of eggs. Yet it may easily be true that a hen of the non-sitting breeds may lay an egg every day for a long period. The Black Spanish hens often do this, and we have personally known one to lay two eggs in one day, but there was none the next day. Hens can not well cover goose eggs and keep them warm, they are too large. If the bottom of the nest is made warm with down or feathers, a hen may possibly keep six of these eggs warm enough. A young bird needs no help to get out of the shell, unless it is very weak, in which case it is about as well for it to remain there, as it would probably fail to thrive. If the chicks should need any help, this can be very easily given when an incubator is used. Light Brahma chicks, when newly hatched, are all white; Dark Brahmas are black and brown; Plymouth Rocks are black and yellow, and Black-red Games are black and yellow, or brownish.

"Currants" and Sultana Raisins.—Our common currants, got their name from some resemblance to the fruit imported into England long ago

from Corinth. These were called "corinths," whence the name currant. The dried fruit sold in the stores as currants, are really small seedless grapes. A correspondent in a recent "Gardener's Chronicle" gives an interesting account of their culture. It appears that their production is confined to a limited district on the Gulf of Patras, and that the vines taken elsewhere are so apt to produce fruit with seeds, that their culture can not be general in other localities. The vines are trained to stakes, until strong enough to support themselves, and found to yield, when in full bearing, from 50 to 90 bunches each. The best growers place the gathered bunches in trays, 6x8 feet, exposed to the sun. Should a rain come, the trays are stacked in piles, with a temporary roof to protect them. The fruit falls from the bunches in about six days, and the drying is completed in about six days more. The average yield is about 25 cwt. per acre, valued at the place of export at about $100 per ton. The Sultana raisins are from another seedless grape, and their culture restricted to the hills about Smyrna. The clusters, when picked, are dipped in ley to which a little olive-oil is added; this is thought to facilitate the drying. The export of currants from Greece in 1876 was 86,500 tons, and that of Sultanas is about 10,000 tons annually.

The Attar or Otto of Roses.—The war in Turkey not only interrupts the production of wheat and other articles of food, but also that of luxuries. The district of Kezanlik is the priecipal source of what is known as Attar or Otto of Roses, which is properly the Oil of Roses, the others being Turkish names meaning perfume. According to a correspondent of the London "Times," the passage of the armies has left hardly a house or a crop standing in the whole region, and those who indulge in the usually costly and much adulterated perfume, will have to pay still more for it. The roses are cultivated in hedges, and the flowers collected before sunrise, are placed in a rude copper still with water, heat applied, and the water that distils is collected; after standing a day or two, the small quantity of oil that distils over with the water, rises to the surface, is skimmed off. To produce one pound of oil, 2,800 pounds of roses are required, upon an average, though the yield is affected by the season, and is often much less. The annual yield of this district was 1,800 pounds, and about as much more was produced in all the rest of the country. The perfume is also produced in India, at localities on the Ganges, and elsewhere, is all consumed in the country.

Steam Plowing.—"J. G.," Polk Co., Minn. A steam plow is used by Landreth Bro., of Pennsylvania, the extensive seed growers. We know of no others in use this side of Louisiana. There are thousands in use in Europe and many in Egypt.

"Apple Sass."—In whatever the American agricultural and horticultural journals may be inferior to the English, it is not in courtesy to their readers. The English editor is often—to put it mildly—snappish. Our correspondents are often, no doubt, as unreasonable as theirs, yet we should think it on the north side of politeness were we to adopt the manner of the "Gardener's Magazine," and reply to a correspondent thus: "'E. S.' Not having time to name your thirty varieties of apples and pears, we have sent them to the kitchen, and have not seen them since,"—a plain case of "apple sass."

Will a Grain Drill Pay.—"C. M. C.," Bradford Co., Pa. A grain drill will cost about $80. Its use will save half a bushel of seed per acre, and add a few bushels per acre to the crop; it will also sow grass seed and grain at the same time, and sow ten acres a day. One can easily see if it will pay to use a drill or not.

Long Island Lands.—Inquiries are made by various western publishers about lands on Long Island. It appears that nearly every paper in the northwest has received a proposition to give a named space in their advertising columns in exchange for a deed of an acre of land in Suffolk Co., L. I., and inquiries are made as to the character of the lands. Long Island is very *long*, and on it there is land and land; having a friend who was "born and raised" not far from the tract in question, we made inquiries, and learn that this very land was sold not long ago for 50 cents an acre. Our friend says it is the "sandiest kind of sand," and gives it as his opinion that whoever buys an acre of it at any price "will get *stuck*."

A Novelty in Furs.—An English fur-dealer thus winds up his advertisement: "N. B.—Capes, Victorias, etc., made up for ladies in fashionable style, out of *their own skins*." The Italics are ours.

Trouble with Hydraulic Rams.—"R. S. C.," Wakefield, Mass. As water absorbs a certain quantity of air, the air chamber of a ram in times becomes emptied of air and filled with water. This will always happen sooner or later, as the water contains more or less air, or flows from a rapid stream or a quiet spring. The remedy is to remove the air chamber and empty it of water and replace it, whenever the ram stops. By not understanding this, many persons unjustly find fault with this useful machine.

Air Beneath the Skin.—"Mrs. B.," Everett, Mass. The presence of air in the cellular tissue beneath the skin, causes soft fluctuating swellings. It is known as Emphysema, and occurs as a symptom in some acute diseases, and sometimes happens when no disease is apparent. It may disappear without treatment, leaving no ill effects, or be dislodged by puncturing the skin.

Farm Apprentices.—"J. J. M." We know of no one who would be willing to take a young man as a student on a well-managed farm, and give him board for his services. The services of a novice upon a well-ordered farm are worth less than nothing, because he requires to be shown how to do everything, which is more trouble than doing it without such help. It is customary that a certain sum be paid as an equivalent for the trouble of teaching a novice in farming. Generally, $300 a year is charged, which covers board.

Means for Cooking Feed for Pigs.—"H. H.," Shelborne, Vt. A common open kettle of large size, set in a brick arch, would serve very well to cook the food for 30 to 50 hogs. This would cost very much less than any of the other steaming apparatus made specially for this purpose.

The Black Board in the Sunday School, by Frank Beard. New York, Jesse Haney & Co. As its title implies, this is especially intended for Sunday School instruction, but it is very useful for one who would learn the art of black-board illustration for any other purpose. A handsome work finely and abundantly illustrated.

How Superphosphate is Made Ineffective.—"H. B. S.," Franklin Co., Pa. Superphosphate is simply insoluble phosphate of lime that has been treated with sulphuric acid so as to separate a portion of the phosphoric acid from its base, the lime, and render it free and soluble. If the superphosphate is brought into contact with lime, as on newly limed land, the free phosphoric acid at once unites with the lime, goes back or "reverts" to the condition in which it was previously, and becomes insoluble and inert. Therefore, when superphosphate is used on land that contains fresh lime, it is practically useless, and is lost so far as present effects are concerned. Superphosphate should not be used until the second year after lime.

A Profitable Hen.—F. R. Kinney, Worcester, Mass., sends a portrait of his brown Leghorn hen, (Red Ribbon 2d), which has recently died. we suppose of old age, being ten years and two months old. During her life she laid 2,151 eggs, or an average of more than 210 each year of her life. This is not the only hen Mr. Kinney has had of this breed, that has been remarkably prolific of eggs; this goes to prove the frequently published statement, that a hen can only lay about 600 eggs in the course of her life, to be a mistaken one. Mr Kinney claims this hen to have been the most prolific one ever reported.

Chemicals for Compost.—"D. S.," Bell's Valley, Va. It is not proper to mix soluble chemical fertilizers in compost heaps. They are more effective when used alone, and spread on the land at the season when they can do most good. For composts, those substances are needed which take some time to decompose, or those fermentable matters, which communicate their action to inert materials, and so cause them to rot more quickly. Lime or wood ashes may be used along with some yard manure, to set up a destructive fermentation in such matters as swamp muck, leaf-mold, or vegetable refuse; but the latter should be in the greater proportion than the former, else ammonia will be lost.

Value of a Fertilizer.—"W. P.," Cool Spring, Del. A fertilizer containing 2½ per cent ammonia, and 10½ per cent soluble and available phosphoric acid, is worth in the market about $40 a ton. These are the usual constituents of what is known as "ammoniated dissolved bone," or superphosphate. In this shape the ammonia costs 30 cents a pound, and the phosphoric acid 12 cents. Generally all the ground bone of respectable manufacturers is pure; that from glue factories being deprived of its animal matter, is consequently devoid of ammonia; adulteration is only practised by obscure persons without reputation. If you buy from well known dealers or manufacturers, there is no risk of loss unless by accident, and then reparation will be cheerfully made.

Nuts and Nubbins.

There are floating around in the daily papers, numerous items which may afford our readers a pleasant variety if introduced occasionally among our matter of fact teachings. We have a strong belief in the utility of fun and laughter, and in complying with suggestions from several that we occasionally give some humorous items, we have collected a large number from the newspapers of the day. Upon looking these over to make a selection for our columns, we were surprised to find how few of the whole we cared to print. Aside from those lacking point, many were really irreverent and making fun of those things which all right thinking persons regard as sacred; others make light of marriage, and assume that the relation of husband and wife is of necessity one of mutual deception. A large share of fun is directed to the "mother-in-law." It may be that there are such mothers-in-law as comic writers regard as the type of this excellent class of women, but we are happy to say that we have met with none. If our selection of "Nuts and Nubbins" is small, it is because we think it better not to be funny at all, than to be so at the risk of injuring the feelings of any person or class. We take these items wherever we find them, without crediting their sources.

Greenland has no cats. Imagine cats in a country where the nights are six months long.

What is the difference between a hill and a pill? One is hard to get up, and the other is hard to get down."

A person who had been listening to a very dull address remarked that everything went off well—especially the audience.

Milly (just returned from a visit to her grandmother): "Mamma, what do you want a mamma for? You're too big to put in the closet."

A little girl, yesterday, while watching the rain, turned to her mother and said:—"Ma, I guess the weather's so warm it's melting the clouds."

The intention of the old deacon was good, but the way in which he worded his notice was infelicitous. He said: "Any members of this congregation who have left off wearing apparel will please contribute the same to the poor." A quiet smile pervaded the house, and the people thought that it would be hardly the proper thing to leave off wearing apparel in the chilly December.

English farmer (after anxiously inspecting strangers): "What be they gentlemen doing, maister?"—Visitor: "Sketching your house; they are artists, and may be they will paint it."—Farmer: "Well, I am sure they be welcome; it wants it, and whitewashing, too, mortal bad."

"Some little time ago I was instrumental in getting a cook for a newly-married friend. I did not often see my friend, and last week, upon meeting a sister of the cook, I asked her how her relative liked her place. "Oh, very well, sir! the master and mistress are quite gentlefolk; they don't know anything."

A Harvard student was called to account for having publicly styled the professor of Hebrew "a first-class mule." He admitted having made the remark, but said he intended it as a compliment. "Explain yourself," said the professor. "Why, a first-class mule is necessarily a good He-bray-ist." *Nol pros.*

One thousand shingles, says a newspaper paragraph, will cover one hundred square feet of surface. One shingle, by the way, will cover six square inches of bad boy, and, if properly applied, will be productive of as much benefit and more noise than one thousand shingles on one hundred square feet of surface. Figures won't lie.

A youngster who had been warned of the evil effects of mince pie heard a mouse squeal after he had been put in his crib and asked his mother: "What dat noise?" "Oh, it's a little mousey; it won't hurt," was the reply. After a few minutes' silence the youngster remarked: "Guess de mousey been eat miss pie 'fore he go bed, an' made he ky."

One of the pleasant events of Christmastide was the presentation, in one of the leading industrial establishments of Buglington, says the "Hawkeye," of a handsome gold watch and chain to each of the employees by the proprietor. Come to think it over, we believe it was the employees who presented a gold watch and chain to the proprietor. We thought we had never heard of a precedent for the former reading.

A man near Pittsburgh, Pa., recently advertised for a bookkeeper, and within twenty-four hours he had one hundred and thirteen applicants for the position. Subsequently he sought a man for his farm by the same means, and had eight responses. These figures represent very fairly the disproportion of laborers in the various industrial pursuits. There are men needed in abundance for agriculture and other manual labor, but when a young fellow is able to write a fair hand, and balance the day's transactions in a country store, he feels above the farm, the anvil, or the bench. This is all wrong, and is of a piece with the other inflated notions that prevail.

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Originated by Prof. STOCKBRIDGE, Professor of Agriculture in the

MASS. AGRICULTURAL COLLEGE.

40 to 80	Bushels	Corn	per	Acre,
25 to 50	"	Wheat	"	"
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25 to 50	"	Barley	"	"
150 to 250	"	Potatoes	"	"
1500 to 2100	lbs.	Tobacco	"	"
2000 to 4000	"	Hay	"	"

and other crops in proportion, have been produced by the use of these manures alone. The results on **Corn** and **Grass** are truly wonderful.

A special manure is made for each **Farm** and **Garden Crop**, containing the **Plant Food** which each particular Plant requires. These manures were used on more than **10,000 acres in 1877**, and with Great Success.

Send for Pamphlet for 1878, full of information, mailed free.

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This is the only fertilizer professedly containing all the soil elements found in each crop. Prof. W. O. Atwater, of the Connecticut Agricultural Station, analyzed six of our different fertilizers, and found in every case, as we guaranteed, **that they contained a larger percentage of Plant-food elements** than we claimed by the labels placed on each package. Send for circular. Address

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Grows **WHEAT and GRASS, equal to manure, at Half the Cost,** and lasts twice as long.

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ESSEX PIGS.—Subscriber has 30 Seven-Eighths Essex Sows, descending from Joseph Harris' Boar "Old Abe," and his Sow "Lady Bess," of which he will sell some, with Pig by his Thoroughbred Essex Boar No. 523, (raised by Joseph Harris,) boxed and delivered to Express Co., for $10 each, adding 5 cents per lb. live weight. Also some fifteen-sixteenths Essex Pigs, farrowed last fall, $5 each, adding 10 cents per lb. live weight. Orders for April Pigs received at same rate. State size wanted, and enclose $5 with order. Balance C. O. D. Otto Ernst, Clay Mines, South Amboy, N. J.

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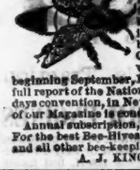

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Send stamp for Illustrated Price-list. Be careful that the chairs are stamped with my name in full; others are IMITATIONS.

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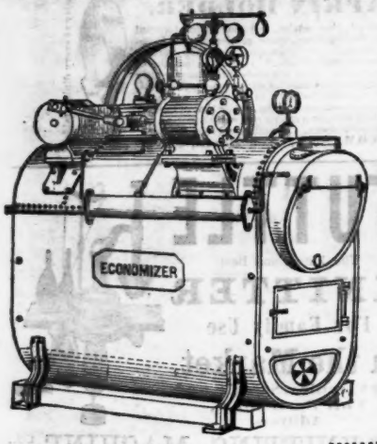
MANUFACTURING OUTFITS,

FURNISHED BY

WHITMAN & BURRELL, Little Falls, N. Y.,

at still lower prices.



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FOR FARMERS, MACHINISTS, PRINTERS, AND ALL REQUIRING LIGHT POWER.

Sizes from One to Six Horse Power. Prices for Engine and Boiler Complete, from $150 to $450. We make the *Strongest Boiler* and the *Best Engine* in the country.

Call at our Factory and examine, or send for free Illustrated and Descriptive Catalogue.

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STEAM ENGINES,

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Cheapest and best for all purposes—simple, strong, and durable. Also *Traction Engines* for common roads.

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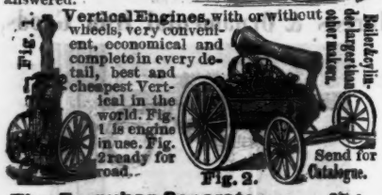

Vertical Engines, with or without wheels, very convenient, economical and complete in every detail, best and cheapest Vertical in the world. Fig. 1 is engine in use. Fig. 2 ready for road.

Boiler 6 cylinder larger than other makers.

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Steam Engines, Horse Powers and Threshers, all kinds. Also, Ploughs, Cultivators, &c., &c.

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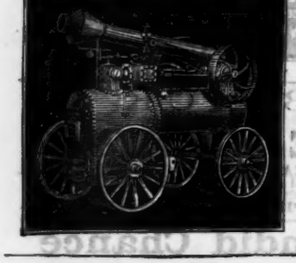

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[See page 240, *Agriculturist*, 1877.] Send for Centennial Judges' Report and Catalogue of Engines, Boilers, Sawmills, &c. Address

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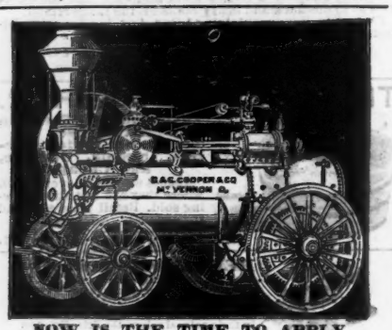

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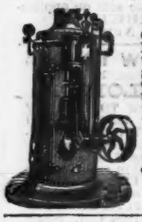

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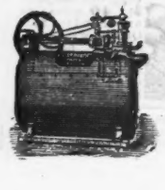

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Made by Special tools.

All parts duplicated.

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EVERY MAN HIS OWN MILLER.

The only Mill that will grind Corn with Shuck on without extra expense.

The only Mill grinding Corn and Cob successfully, that will grind Shelled Corn fine enough for family use.

Grinds twice as fast as any other Mill of same size and price.

This Mill took First Premium at

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Shells and Grinds Six to Fifteen bushels of Corn per hour. Two to four horse power. Send for Circular. Address

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THIS patent portable Muley Saw Mill is adapted to any locality, will saw any kind of logs, and will do as much work (power and hands being considered) as the best Circular Mills. Its frame, head-blocks, and working parts are of the most substantial and permanent kind, being made entirely of iron and steel. It is usually set up and started in from one to two days time. It is generally driven by threshing engines of not exceeding ten horse power. It cuts from 2000 to 4000 feet of inch lumber per day. The Mill and Engine may conveniently be operated by two men. Send for circular.

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From the 13th to the 17th of June, 1878, under cooperation of the Section for Agriculture and Horticulture, at Hamburg, and the Union of German Manufacturers and Dealers in Agricultural Machinery, an International Exhibition of all kinds of Agricultural and Garden Implements, will be held in Hamburg, Germany. It is well known that the endeavor of the above named Union has been to liberate manufacturers from the necessity of sending their goods to all Agricultural Exhibitions, whether large or small, enabling them thus to sell their manufactures at lower rates to the farmers. This result is intended to be obtained by limiting the number of exhibitions to the commercial centers of the German Empire, to be periodically repeated. For Northern Germany, Hamburg appears to be the most favorable place, where the various railroads, etc., connect with the seaport, and this leads to the hope that foreign nations will be represented there, so that the farmers and peasantry who will visit the exhibition may have the opportunity of witnessing a complete collection of all kinds of tools for husbandry, and systems in all parts of the world.

Plans and directions for sending to these International Machinery Markets, will be sent, free of charge, from the office of the undermentioned committee, 25 A B C strasse, Hamburg. The committee for the International Agricultural Machinery Exhibition at Hamburg, in 1878:—ALB. VON OHLENDORFF, President; HERM. SCHEMMANN, Treasurer; Dr. RICHARD SEELEMANN, Recorder; CLAUS OLDE, S. MAGNUS, Engineer. HERRMANN H. BIEBER-TATENBERG, G. F. SCHWABE-WALTERSHOF, COUNT VON HOLSTEIN-WATERNEVERSTORF, W. H. BOKELMANN, KIEL L. JOHANNSSEN-SOPHIENHOF, B. HENNEBERG-POPPENBUTTEL, Councils; KUSTER-SILLUM, Chief Steward; CREYDT-HARSTE, G. J. BOCK-GR. WELTZIN, GRAF ZUR LIPPE-WEISSENFELD, in Rostock. General Secretary PETERSEN, Oldenburg. Engineer KAYSER, Berlin.

THE HARVEST OF 1878.

For description of **A Wonderful Improvement in Harvesting Machinery,** see page 400, October number *American Agriculturist.* For further information address Whiteley, Fassler & Kelly; Champion Machine Co., and Warder, Mitchell & Co., of Springfield, O., and The Toronto Reaper and Mower Co., Toronto, Canada.

HEEBNER'S HORSE POWER
WITH
PATENT LEVEL TREAD
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SPEED REGULATOR.

Heebner's Improved Threshing Machines. Send for Illustrated Circulars to
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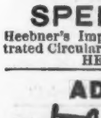

contain all the most modern improvements, to wit: Hard Metal—Adjustable Beams; also Reversible Slip Points, which reduce cost of repairs and keep plow always sharp. They excel in the three great points of a plow, viz: Scouring—Lightness of Draft—Perfect Lifting Repairs. All Sizes, Both Handi. Wood and Iron Beams. The Automatic Swivel Plow for Level Land and Side Hills. Rocking Teeth Smoothing Harrow and Best Wheel Harrow. Field Rollers. Allowance made for freight.
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Constructed entirely of iron and steel. Easily operated entirely by *one lever.* Simple, strong, durable. Performs better work in unskilled hands than a skillful plowman can do with walking plow. 7,000 sold and in use in two years, giving unbounded satisfaction. Gold Medal at Illinois State trial 1874, and Indiana State trial 1876, the two highest ever awarded sulky plows.
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Power Corn Shellers and Cleaners.
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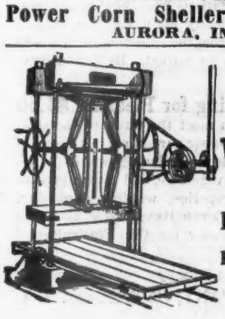

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WITH
Double Platform.
BOOMER & BOSCHERT PRESS CO.,
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YALE VERTICAL MILLS, and Yale Vertical Engines.

The best built and best finished Machine in the Market. "The best is the cheapest."
The **Yale Vertical Mill** has an iron frame, and the very best of French Burr Stones, is self-oiling and self-feeding, *and for quantity and quality ground it has no superior.* Adjustable-balanced; long bearings, best arrangements, and in every respect it is the cheapest mill ever offered.
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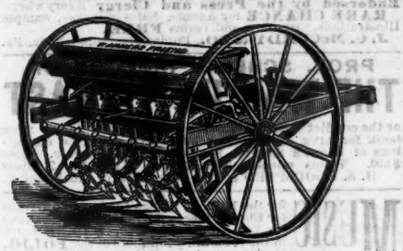

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The quantity is regulated with gear-wheels **in a CONE,** so there are no **loose wheels** or **movable feeders,** and it will sow any grain perfectly and accurately.
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Every Mill Guaranteed as above.
Each piece fitted and numbered at the Factory, so that farmers and others can erect their own mills if desired, using our drawings and instructions for a guide. *Send for Illustrated Catalogue & Price List.*
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MANUFACTURER OF
Cucumber Wood Pumps
For Wells and Cisterns.
Agents Wanted. Send for Circulars.
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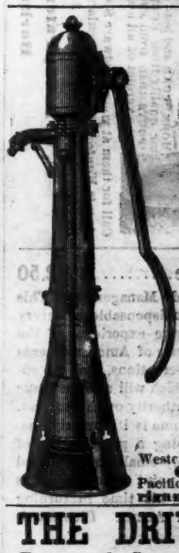

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TOWN and COUNTY privileges for making **Driven Wells** and selling Licenses under the established **American Driven Well Patent,** leased by the year to responsible parties, by
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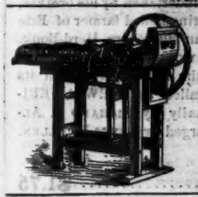

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For Plantations and Oil-Mills. Used by Planters, the Oil-Mills in New Orleans and through the country. Send for Circulars and Judges Report. Pay for itself in a few weeks.
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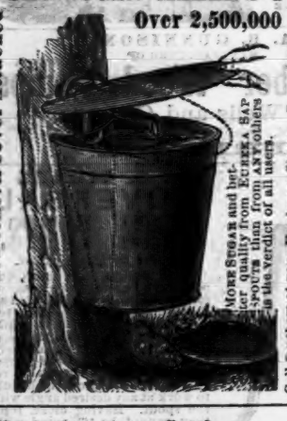

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